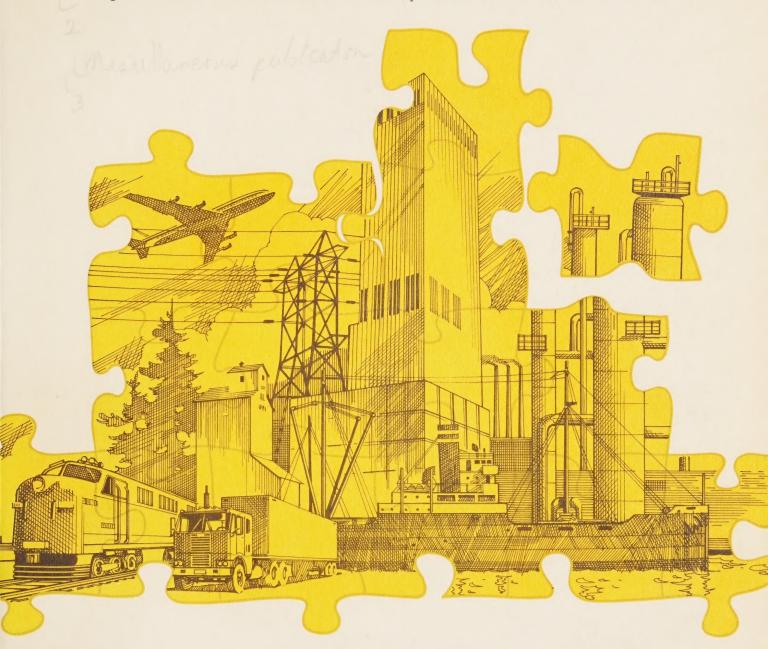
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Royal Commission on Corporate Concentration



STUDY NO. 17

Enterprise Structure and Corporate Concentration

A Technical Report



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A Technical Report

by

Stephen D. Berkowitz Yehuda Kotowitz Leonard Waverman

with

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Institute for Policy Analysis
University of Toronto



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FOREWORD

In April 1975, the Royal Commission on Corporate Concentration was appointed to "inquire into, report upon, and make recommendations concerning:

- (a) the nature and role of major concentrations of corporate power in Canada;
- (b) the economic and social implications for the public interest of such concentrations; and
- (c) whether safeguards exist or may be required to protect the public interest in the presence of such concentrations".

To gather informed opinion, the Commission invited briefs from interested persons and organizations and held hearings across Canada beginning in November 1975. In addition, the Commission organized a number of research projects relevant to its inquiry.

This study on directorship ties as an approach to industrial concentration is one of a series of background studies prepared for the Commission. It was researched and written by Professors Stephen D. Berkowitz, Yehuda Kotowitz, and Leonard Waverman under a contract with the Institute for Policy Analysis of the University of Toronto. Professor Berkowitz is a sociologist while Professors Kotowitz and Waverman are economists. Each has written previously in the area of interlocking directorates.

The Commission is publishing this and other background studies in the public interest. We emphasize, however, that the analyses presented and conclusions reached are those of the author, and do not necessarily reflect the views of the Commission or its staff.

Donald N. Thompson Director of Research

ACKNOWLEDGEMENTS

When one writes a report on a study of this complexity, he incurs an enormous number of intellectual and personal debts. Chief among these have been those we owe to Bruce Becker, Randy Bradford, Peter Carrington, June Corman, and Gregory Heil who contributed their skills, time, and effort to the formulation and execution of the research design embodied here. Without their critical comments, advice, and technical help it could not have come to fruition. Larry Felt, Manny Gordon, Graham Lowe and Patricia McDermott helped to plan and organize the data system upon which the present effort rests. Terry Berkowitz, Rochelle Klein, and Ruth Zeitlin provided critical work in times of duress which helped to keep everything running smoothly during this earlier period in time. Sharon Carrere, Susan Robbins, and Michael Zeitlin worked tirelessly and carefully on the often tedious but necessary task of data gathering both for our data system and the study reported here. Judy Bintliff, Bob Fisher, Jack Klebanoff, Olga Puchmajerova, and other part time programmers and research assistants who cannot, for reasons of space, be thanked personally here, contributed their time and energies to various phases of the construction of our data system. Sawyer, director, and Tom Wilson, former director, of the Institute for Policy Analysis provided critical intellectual and administrative support. Derek Mansfield, Deanna Duchene, Ursula Gutenburg, and Trish Grabb of the Institute's staff helped to expedite all the phases of the project -- often giving us assistance well beyond what we had a right to expect.

Outside agencies and groups which provided funding and the persons connected with them, who often provided timely aid and sage advice deserve our warmest thanks. In particular, Mr. Robert Bryce, Chairman and Dr. Donald Thompson, Research Director, and the staff of the Royal Commission on Corporate Concentration gave us invaluable help in both the formulation and execution of the present project. Dr. H.E. English, and Dr. A. Loyms, of the Department of Consumer and Corporate Affairs, which supported the initial phase in the construction of the data base we used here, made much of the present work possible. Peter Blitt, Alex Foti, William Krause, Harley Potter, James McVey, and Nicholas Stosic of the staff of Statistics Canada, which processed our enterprise definitions and aggregated the relevant data on shipments for us and for the Royal Commission cooperated and willingly collaborated with our research team throughout the present study. V. Berlinghette, who supervised the support provided by Statistics Canada for our research, helped to coordinate our joint effort.

Our colleagues, Richard Caves, of Harvard University, Don McFetridge of Carleton University, and Dennis Tsichritzis, of the University of Toronto, provided both support and encouragement for our work. The responsibility for the conclusions reached and any errors of ommission or commission in the present document, of course, is ours alone.

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1. OVERVIEW

PURPOSE

This project had a threefold purpose. First we attempted to rigorously define an enterprise as one or more companies which operate under common control. We investigated alternative definitions of what constitutes control. These definitions involved either majority ownership of the voting stock of a corporation (more than 50%) or some combination of ownership of the voting stock (15% or 25%) combined with three or more directors (and/or officers) or executive board members in common. Including minority ownership under a definition of control recognizes the possibility of pyramiding: owning a small but controlling interest in a single holding company, which in turn controls other firms. Secondly, we examine and attempt to explain the degree of pyramiding in the Canadian economy in 1972. Finally, having defined enterprises, our next objective was to measure the change in concentration between a base case (more than 50%) and four alternative enterprise measurements.

Economic theory describes the behaviour of independent economic units. Yet much research uses data on companies which may not, in fact, be independent. For example, imagine that we wished to judge the competitiveness of a specific industry. In order to do so, we measured the concentration in the industry by calculating the share of the industry's output produced by the largest four firms. If this concentration ratio turned out to be 40%, we would then decide that the industry was reasonably competitive. But suppose that the largest four firms were not independent but were all owned to some degree by one of the four firms. We would then wish to judge whether this 'ownership to some degree' meant that the four firms acted in concert. If they did, concentration would be far higher than we judged on the basis of assuming that the sales of individual companies were independent. We would then wish to aggregate the four firms into a single enterprise.

We are not the first to be aware of this measurement problem. As early as 1932, Adolph Berle and Gardner Means in their book, The Modern Corporation and Private Property suggested that the absolute size and wide dispersion of the voting stock of large corporations meant that control could be exercised with less than 50% ownership. They argued cogently that 20% ownership of the voting stock in a single block meant control, i.e., the ability to elect the directors of the corporation.

Canadian agencies have used two methods to organize firms into enterprises. In its 1965 study on Concentration in the Manufacturing Industries of Canada, the Department of Consumer and Corporate Affairs included within a single enterprise all firms owned by more than 50% and all cases where control was 'acknowledged'. Unfortunately, the Department had data covering only 50% of the shipments in the

manufacturing sector. Moreover, it is not clear that 'acknowledged' control is actual control or that the unacknowledged control means no control.

In the 1968 Statistics Canada study on Concentration in the Manufacturing, Mining, and Logging Industries, "all companies owned by more than 50%, directly or indirectly, were grouped together into enterprises ... Control may be possible with ownership of less than 50% of the voting stock but these cases are treated as separate enterprises in this report".

In a related study, J.M. McVey argued that redefining control at the 25% level did little to change concentration as measured in the 1968 study.

We set out to examine the combined ownership and director (officer or executive board) ties among the largest corporations in Canada. We argue that unlike Berle and Means' suggestion, the ability to elect the directors of another legal entity is one aspect of control but not its end result. That end is to control the activities of the other firm.

By examining both ownership and other ties in a precise mathematical way, we can analyze the importance of these ties in assessing the concentration of the Canadian industrial structure. By ignoring minority ownership which is not coincident with interlocking ties, we are able to differentiate ownership for investment purposes from ownership for control.

DATA

Five sets of information were needed for our study:

- the largest firms in the economy and all other firms directly or indirectly connected to them;
- 2. the ownership links among these companies;
- 3. the directors of all these companies;
- 4. the officers of all these companies;
- 5. the executive board members of all these companies.

Because of the existence of private firms (private companies owned by fewer than 50 shareholders need not publish annual statements) and Crown corporations, sampling the largest firms in the Canadian economy is not an easy task. Relying on two previous studies we were able to determine the 361 largest corporations involved in the following activities: industrials, banking, trust, insurance companies, transportation firms, utilities, merchandising firms and other financial intermediaries.

Finding all the firms directly and indirectly connected with these 361 was based on ownership patterns. The Inter-Corporate

Ownership report for 1972, which is based on the Corporations and Labour Unions Returns Act (CALURA), lists all ownership ties for Canadian companies of 10% or more if domestically controlled and 5% or more if foreign controlled. Taking our set of 361 large firms, we found 4,944 more companies connected with them in the CALURA data.

We listed principal officers for each company: President, Vice President, Secretary, Treasurer, Secretary-Treasurer, Controller, Comptroller, manager, general manager, professionals (legal counsel; medical director), and other officials.

Our basic sources for director and officer lists of these 5,305 companies was the Financial Post's Directory of Directors. Because that publication is not exhaustive, especially in terms of private companies, Crown corporations and foreign directors, it had to be supplemented by a number of other sources—Moody's Industrial Manual, Standard and Poor's Register of Corporations, Directors and Executives, Who's Who in Canada, company reports, and provincial governments' corporation files.

Executive board data were particularly scanty in the *Directory* of *Directors*. The Commission therefore sent a questionnaire to a designated group of firms and we incorporated the returns into our data files.

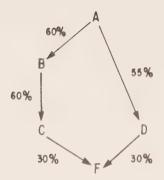
In total, the 5,305 companies had 7,433 individuals listed as directors/officers and executive board members.

All this information was input, corrected and prepared for formal analysis with the aid of a set of specially constructed computer programmes created for this project.

METHOD

We define an enterprise as a number of companies under common control according to alternative criteria. Let us take the example when more than 50% ownership of the voting stock or at least 15% ownership and 3 directors are sufficient to establish control. We assume that if A controls B and B controls C, then A controls C. We further assume that A can control F indirectly through other firms C and D if the sum of ownership through C and D is sufficient to achieve control.

In the diagram below, the numbers indicate the percentage of voting stock held. A controls over 50% of the stock in B and D, and is therefore assumed to control both corporations. B controls C in a similar fashion. Therefore, A controls C. Neither C nor D, alone, controls F. However, since A controls both C and D, A's effective ownership of F can be discovered by adding together C's and D's ownership in F. Therefore A controls 60% of the voting stock in F--and controls F accordingly.



The arrows represent the direction of ownership, the figures the percentage of stock held.

In our study, we did not consider minority control alone sufficient to constitute effective control of one firm by another unless it was accompanied by a number of directors, officers or executive board members in common. The Inter-Corporate Ownership publication lists ownership of 10% or more for domestically controlled corporations. Because we had no a priori criteria for judging what exact percentage of ownership or numbers of directors in common constituted control, we examined the data to determine points where small changes in definition did not lead to significant changes in enterprise groupings.

We found that more than 15% and more than 25% ownership and three directors/officers (or executives) levels generated relatively stable enterprise groupings.

As a result, we computed enterprise groupings according to five different definitions of control:

Benchmark: More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

In considering ties that indicate control, we distinguish between directors/officers in general and members of the executive board. The latter, we maintain, are involved in the day-to-day operations of the firm, while the former may not be involved in

detailed policy decisions. Consequently, while director/officer ties give potential control they may not signify effective exercised control.

EXECUTIVE BOARDS

Since more than 50% ownership unambiguously defines control, we interpreted each alternative measure as identical to more than 50% ownership. Where more than 15% ownership plus three ties is hypothesized to yield control, each director is 'worth' 12%. We also assigned 12% to each tie when only two exist, in order to capture firms within enterprises marginally below the control criteria. For example, 40% ownership plus two directors in common would not constitute control under a strict interpretation of the 15% plus three ties rule.

RESULTS

On average, the largest four firms in each industry produced 50.35% of that industry's shipments under enterprise definitions at the more than 50% ownership level (Table 1). Weakening our definition of control to more than 15% ownership plus three director/officer ties in common increased this mean four-firm concentration ratio to 50.66--not a significant change.

Of the 153 manufacturing industries for which concentration data is available, in only eight does concentration in fact change when the definitions of control are loosened. Because of confidentiality restrictions we do not know which those eight are. However, in Table 2, it can be seen that changing the definition of control from a straight more than 50% to more than 15% plus three directors (B) increases the four-firm concentration in the two industries with low concentration (less than 30%) by 9% (e.g., the four-firm concentration ratio could increase from 20% to 21.8%). In the industries with moderate concentration, loosening the definition of control increases concentration by 7.6% (again a relative difference, not an absolute one). In the three industries with relatively high concentration, loosening the definition of control relatively increases the four-firm concentration ratio by only 2.4%.

The effects of changing definitions of control on the top four concentration ratios, small as they may be, exceed, in most cases, the effects on the top eight concentration ratios (the share of shipments of the largest eight firms). This suggests that minority horizontal control is used more extensively by the largest four firms in an industry than by the next four largest. Moreover, this minority control by the four largest involves some member of the next four largest.

Note, again in Table 2, that changing the definition of control from either over 15% or over 25% plus three directors to over 15% or over 25% plus three executive board members makes very little

difference. Effective horizontal minority control does not then encompass the use of executive board members who are not also directors or officers.

These results are anticlimactic: minority control is not a significant force in extending control horizontally over competitors in Canada.

We did not investigate the nature of other ties (vertical, related, diversified, etc.) in the same detail. However, observation of the data suggests that minority control was not very prevalent except in certain circumstances. In fact, the most striking result of our study was the very low degree of minority ownership leverage in the Canadian economy.

We then turned to an explanation of the reasons for this result.

- 1. The value to a firm of minority ownership leverage or pyramiding depends on a number of factors:
 - a. the management capacity of the controlling group must exceed that required for their present firm's size;
 - b. the controlling group must have a proven track record of high profitability;
 - c. the firms the controlling group wishes to acquire must be large in absolute size, or else 100% ownership is necessary.
- 2. The potential value of minority leverage is limited to those cases in which 100% ownership is not required for other reasons. However, in a number of instances, 100% ownership is necessary:
 - a. where the potential acquisition increases the profits of the controlled firm, 100% ownership is desirable to maximize profits;
 - b. where the acquisition results in a complex transfer price for services sold between firms, 100% ownership is desirable to avoid suits from disgruntled minority stockholders;
 - c. where the potential acquisition would result in a transfer price for services sold by a domestic firm to a foreign parent, 100% ownership is desirable to avoid problems of minority shareholders unhappy with the division of profits between the two firms and the resulting division of taxes.

From a review of these considerations, we conclude that the major reasons for the lack of ownership leverage in the Canadian

economy are twofold: first, the number of potentially large corporations with sufficiently good management that can attract funds by way of minority control is limited by the size of the Canadian economy. Second, many large foreign owned corporations have easy access to capital in their home countries and consequently no need for extending ownership leverage within Canada.



2. CONCENTRATION, ECONOMIC EFFICIENCY, AND EQUITY

Why are we interested in the concentration of economic power? Theoretically, when economic units are small relative to the market place, and when there are a large number of sellers and buyers, market price is determined by the equilibrium of demand and supply and no latitude for the exercise of discretionary power exists. No seller can charge more since buyers can find alternative sources of goods. Under these assumptions, the discretionary power of any single agent in the market place is small. Since the equilibrium of demand and supply occurs at minimum costs, waste is minimized and efficiency of resource allocation is maximized.

While there are flaws and faults in this story of perfect competition, discretionary power--power to charge more than the market place, and power to waste resources--is minimized. ² Moreover, while the resulting income distribution may be highly skewed, firms and their owners do not receive an inequitable share of national income since they cannot realize monopoly profits.³

In examining Canada's industrial structure in 1972, we are interested in the extent to which the actual concentration of economic power deviates from that assumed in the competitive paradigm. We intend to do this by examining alternative measures of interdependence among firms—and, hence, the size of groups of firms operating under common control (enterprises) relative to the markets in which they operate.

How do we measure the extent of the concentration of economic power? We have defined economic power as the ability to exercise discretionary authority in an industry or a market. Our measures of concentration should relate to industries or markets.⁴ Since the classical competitive model revolves around the notion of "many

^{2 -} See Vickrey, op. cit., Chapters 7 and 8.

^{3 -} A good reference on the shares of firms (profits) in national income is: D.S. Projector, G.S. Weiss and E.T. Thorensen, "Composition of Income", in L. Soltow (ed.), Six Papers on the Size Distribution of Wealth and Income, (NBER New York: Columbia University Press, 1969).

^{4 -} Practically, a standardized scheme for designating industrial areas, called Standard Industrial Classifications (SICs) is used by researchers in this field. See Dominion Bureau of Statistics, Standard Industrial Classification Manual (Revised 1970), (Ottawa: Information Canada, 1970).

sellers", one possible approach would be to count the number of firms in an industry:

Economic theory suggests that the vigor of competition is related positively to the number of firms in the relevant industry, other things being equal. However, it makes a difference whether, in an industry with 100 firms, each firm controls 1% of the industry's output, or four firms control 80% while the remaining 96 account for only 20%.5

Therefore, it is not only the number of firms in an industry which determines the extent of competition but also their size relative to each other. The standard measures of concentration, which recognize this, then, compute the percentage of an industry's assets (value of shipments, value added or employment) accounted for by the largest four or eight firms or conversely the number of firms required to account for 80% of an industry's assets). These "concentration ratios" have been the subject of a good deal of research and have been published for Canada for 1965 and 1968.

In order to calculate economic concentration in this sense of "market power", then one must pay particular attention to the definition and use of several terms and operational units: "industries" or "markets", "firms", "establishments", and "enterprises".8

The concept of an "industry" or "market" is obviously an important one in that it refers to the unit in terms of which concentration or market power is measured. Published data, however, normally report aggregate concentration for "industries" nationally

^{5 -} F.M. Scherer, Industrial Market Structure and Economic Performance, (Chicago: Rand McNally, 1971), p. 50.

^{6 -} For a good description of concentration see both J.S. Bain, Industrial Organization, (New York: John Wiley & Sons, 1969) Chapters 5 and 6; and Statistics Canada, Industrial Organization and Concentration in the Manufacturing, Mining and Logging Industries (Ottawa: Information Canada, 1973).

^{7 -} The 1965 ratios were contained in Department of Consumer and Corporate Affairs, Concentration in the Manufacturing Industries in Canada (Ottawa: Department of Consumer and Corporate Affairs, 1971). 1968 figures are in Statistics Canada, loc. cit.

^{8 -} Statistics Canada's 1970 study resolved the problem as follows: "For purposes of the present study, the complexes were found to have the disadvantage that they are based upon ownership links as low as 10% of voting stock. No means were available for determining which cases of minority ownership involved control and which did not. In the circumstances, it was decided to reorganize all complexes containing any minority ownership links. The corporations in the new complexes were all related by ownership links of more than 50% of voting stock". Statistics Canada, op. cit., p. 176.

and not by product markets. Since most industries produce a broad range of products, this is not the same thing.⁹

Ideally, then, one ought to use "product markets" for establishing concentration ratios. In a country such as Canada, where the costs of transporting goods from one region to another are quite high given the large distances involved and a scattered population, overall or national concentration figures are at best a rough-and-ready or crude guide to industrial concentration as it affects actual production at the regional level. However, given that there are relatively few establishments and very few firms and enterprises in most industries in Canada, top four and top eight figures, if they were broken down by industrial category and by region, would seriously disclose the shipping data of individual establishments, firms and enterprises. While these data might be quite illuminating, they would fall well within the bounds of prohibited disclosure under existing legislation. Moreover, from a statistical point of view, use of such data would introduce enormous problems of commensurability, in the sense that top four and top eight category ratios would be based on fewer than four and eight units, respectively, in a significant number of cases. Given these problems, then, we had no choice but to use the conventional national figures by industry; recognizing that they represent a lower bound estimate of actual concentration.

Similarly, we must carefully define the terms "firm" or "company" and "enterprise". Conventionally, concentration ratios measure the shape of an industry's output flowing from four or eight independent units. We must, therefore, be certain that the units we are using are in fact independent. If, for example, we are computing concentration ratios at the "firm" level, we must make sure that the "firms" in question are independent, i.e., that they are not part of some larger enterprise. If they are, concentration values will be understated.

As we define it, then a "firm", "company", or "corporation" is a legal entity encompassing a collection of assets (capital and other) held in common name. These assets may consist of plants ("establishments") in different geographic locations. Each plant, however, must be unambiguously controlled by a specified firm.¹⁰

^{9 -} As a result, three additional statistics are usually calculated: the first examines the regional aspects of industrial operations. The second is a measure of the degree to which an industry specializes in producing a single market product. And the third, the degree to which the total shipments of a single market product are supplied by a single industry. Unfortunately, none of these measures are relevant here.

^{10 -} Please note that we use a threefold classification of units--"establishments", "firms", and "enterprises"--here in order to minimize the confusion sometimes generated by the conventional twofold division into "establishments" and "enterprises".

While "firms" may be considered to be legally separate entities, yet they may not be in fact independent. We define an enterprise as a set of legal entities ("firms") operating under common control. One aspect of our study examines the degree to which the Canadian concentration ratios, as measured, understate actual concentration due to the assumption that firms are independent when in fact they are part of a single enterprise.

In Statistics Canada's 1968 study Industrial Organization and Concentration in the Manufacturing, Mining and Logging Industries, an enterprise is defined as "...all companies owned more than 50% directly or indirectly where "owned" refers to voting stock ... Control may be possible with ownership of less than 50% of voting stock but these cases are treated as separate enterprises in this report...".ll

In the 1965 study of concentration in the Canadian manufacturing sector, an enterprise set included all companies directly or indirectly owned more than 50% and all companies where although less than 50% ownership was involved "control was acknowledged". 12 Information on acknowledged but minority control came from nonpublic files at the Department of Consumer and Corporate Affairs. 13

Thus the 1965 study attempted to include within an enterprise firms which were not independent but where the owner "acknowledged" control, even though it owned less than 50% of the stock in the owned firm. This use of acknowledged control is an excellent method in principle but weak in practice. The private files at the Department of Consumer and Corporate Affairs included statistics on "...most of the large corporations and probably accounted for more than half the total in tons of value of factory shipments". 14

Unfortunately, acknowledged control is not a satisfactory objective definition because the interpretation of control may vary among independent companies. Moreover, the coverage by these non-public files at the Department of Consumer and Corporate Affairs may be unsatisfactory. Network data structures are not like others in the sense that missing data do not simply add to the variance of a system as a whole. This means that "errors" cannot be estimated and adjustments made. Consequently, information on "probably half the value of factory shipments" is not sufficient to construct concentration measures.

^{11 -} Statistics Canada, Industrial Organization and Concentration..., op. cit., p. 8.

^{12 -} Ibid., p. 176.

^{13 -} Loc. cit.

^{14 -} Ibid., p. 176.

^{15 -} Ibid.

Because the degree of control may vary, we do not find it useful to define it uniquely. Moreover, soliciting such information directly from all firms is both expensive and subject to variations in interpretation. Instead, we have chosen to define alternative measures of enterprise groupings according to quantitative measures of ownership and management ties that are in the public domain. We are therefore able to examine differences in concentration and other measures which occur due to changes in the stringency of our enterprise definitions.

An enterprise then is a bounded set of interrelated companies. Each enterprise can then be thought of as functioning as an independent unit. The correct aggregation of firms into enterprises is central to the empirical validation of microeconomic theories in general, because economic theory is built upon the workings of independent units. If, by contrast, we attempt to empirically validate theories by using observations on, for instance, firms when they are not in fact independent, we will either conclude that our theory is wrong or else that our predictions were wrong.

It is on this basis that we argue that industrial organization research should utilize enterprise rather than firm data. If the concentration ratio in some industry is measured on a firm-by-firm basis and shown to be low, but all the relevant firms are directly or indirectly controlled by one of them, the industry is properly seen as a "cartel", not a competitive market structure. Similarly, if companies are independent in terms of their horizontal connections, but control other legal entities through vertical (buyerseller) ties, measures of the "actual" degree of vertical integration will be underestimated unless the vertical relationships among enterprises are considered. Finally, a great deal of attention has been placed on "conglomerates": enterprises whose constituent companies are involved in apparently unrelated economic activities. Without workable operational definitions of "control", and of an "enterprise", we cannot judge the extent of conglomerate control in the economy.

MINORITY CONTROL AND ENTERPRISE DEFINITIONS

The observation that control is exercisable with less than 50% of voting stock is not new. Berle and Means, for example, hypothesized over 40 years ago that minority control of stock in corporations was leading to the concentration of economic power (the share of manufacturing assets) in fewer and fewer hands. They further hypothesized that this was possible because, as the size of incorporated publicly traded companies increased absolutely, it became increasingly possible to exercise control with minority shares where

other share ownership was scattered. In this case, they defined control as the "...actual power to select the board of directors or its majority". 16 Implicitly, control of a legal entity by an outside unit means the ability to choose the individuals who control that entity's actions. Given the expense of proxy fights—and the attendant difficulty in organizing a large number of scattered units each holding a few shares—Berle and Means argued that in most cases effective control can be exercised with approximately 20% of share ownership.

In 1963, R.J. Larner reexamined the issue of ownership and control for the American case. He argued that "in view of the greater size of the 200 largest nonfinancial corporations in 1963 and the wider dispersion of their stock, this lower limit [20%] to minority control seems too high. In the present study, a firm is classified as immediately controlled by a minority stock ownership if 10% or more of its voting stock is held by an individual, family, corporation or group of business associates".17

We argue, however, that this kind of argument over the percentage necessary for control throughout a corporate structure is somewhat misplaced in that it is not possible to argue, a priori, what exact percentage of stock ownership constitutes control in all cases. The answer to this kind of question, we maintain, lies in empirical examination of particular localized circumstances. This is not to say, however, that each case is unique. In principle, it is possible to develop some general criteria -- as, for instance, the absolute size of a corporation and the size of a single stockholding relative to all other holdings -- which could be applied rigorously under varying conditions. In practice, however, the data available are too crude to allow us to do this. Our data do not include family, individual or group ownership statistics, nor does it fully distinguish nominee from beneficial ownership. The best anyone can hope to do at this point, then, is to approximate this kind of a measurement while minimizing errors that greatly distort the available pattern. This strategy will not succeed in every instance. We can, however, rigorously test Larner's general assertion that control is exercised with 10% of a firm's voting stock. 18

How does one firm control another even though it only owns a minority share? It does so by being able to select a course of action for the second firm. We suggest that the presence of a

^{16 -} A.A. Berle and G.C. Means, The Modern Corporation and Private Property (New York: Harcourt, Brace and World, 1969 1932).

^{17 -} J. Larner, "Ownership and Control in the 200 Largest Non-Financial Corporations, 1929 and 1963", American Economic Review (September 1966), p. 779.

^{18 -} Loc. cit.

substantial overlap between the boards of directors of two firms—together with directed ownership—indicates this ability to control. We therefore define enterprise control as "the power to select a course of action for a separate legal entity". In contrast to Berle and Means, then, the ability to elect directors in our study becomes one aspect of control rather than the outcome of control. The study of control and pyramiding through minority ownership and the power to elect individuals responsible for the firms actions thus becomes the central task of this study.

THE OVERLAPPING OF OWNERSHIP AND DIRECTOR TIES

It is clear that when one company (A) owns at least 50% of a second company (B) A can exercise power over B's actions. Firm B would be considered a subsidiary of A, and A--in recognition of its control--would be likely to appoint a majority of B's directors to its board. This situation may, however, have come about for a number of different reasons. For example, A may have purchased the shares in B in order to exercise control. Alternatively, it may have acquired the shares as an investment, preferring to leave B's managers and directors in full control.

Even in this second case, however, we argue that A could alter B's board of directors or fire B's managers as it wished. Power to control, we contend, exists independent of the actual exercise of it. Power to control then, is the capacity to control if need be.

Under conditions of minority ownership, it is not as clear that A can direct B in any way it sees fit. Authorities in Canada and the United States rely, therefore, on reports of "acknowledged control" to define enterprise groupings. These definitions of control in minority ownership situations are usually unique to a given case and thus of limited use for purposes of measurement. Moreover, relatively little formal comparative analysis of different measures has been done which would allow them to be cross-validated.

What we are trying to do here is to develop a measure which is not subject to the same difficulties. We define control as existing either where A owns a majority of the voting stock in B or where A has minority ownership in B as well as some degree of interlocking of a part of their board of directors (or executive boards). If B has no majority owner, it is considered to be part of an enterprise headed by A when A owns a large minority share and the two firms have a specified number of director/officer or executive ties in common.

^{19 -} See footnote 16.

One can observe many different ownership patterns of which an unspecified number represent pure financial investment rather than an attempt to exercise "control" over other firms. We have attempted to minimize the error of including within an enterprise minority shares which are not meant to control by simultaneously examining the pattern of interlocking directorates. When A owns 25% of B but has no interlocking directorates, no control is assumed to be exercised.

THEORETICAL BASIS FOR DETERMINING ENTERPRISE GROUPINGS

Given the variety of arrangements which may be employed by the directors and officers of one firm to exercise either influence or control over the policies of another firm, it is necessary to operationalize the definition of an "enterprise" in such a way as to:

- a. accommodate a number of distinct but functionally equivalent patterns of control;
- b. ensure that the definition of each pattern is rigorous and mathematically consistent with the others.

In doing this, we rely heavily on propositions derived from elementary set theory and graph theory—specifically, as these apply to networks, 20 theoretical definitions of control in social networks, 21 and an earlier study of interlocking directorates. 22

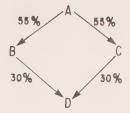
OWNERSHIP TIES

In applying graph theory in this way, we must begin by recognizing that ownership ties are directed (A owns B). Directorship ties, are by contrast, undirected (Jones sits on the boards of both A and B; A is tied with B, B is tied with A). To ensure mathematical consistency of alternative measures of ownership control, we assumed both full transitivity and additivity for both ownership ties and related directorship ties:

^{20 -} R.G. Busacker and T.L. Saaty, Finite Graphs and Networks: An Introduction with Applications (New York: McGraw Hill, 1965); and F. Harary, R.Z. Norman, and D. Cartwright, Structural Models: An Introduction to the Theory of Directed Graphs, (New York: Wiley, 1965).

^{21 -} S.D. Berkowitz, "The Dynamics of Elite Structure: A Critique of C. Wright Mills' Power Elite Model" (unpublished Ph.D. dissertation, Brandeis University, 1975).

^{22 -} L. Waverman and R. Baldwin, *Determinants of Interlocking Directorates* (Toronto: University of Toronto, Institute for the Quantitative Analysis of Social and Economic Policy, 1973).



The arrows represent the direction of ownership, the figures the percentage of voting stock held. No interlocks are involved.

In the diagram above, full transitivity means that if A controls B and B controls D, then A controls D. By additivity, we conclude that the effective ownership of A in D is 60% because, since A controls B, it owns 30% of D through B and, since A controls C, it owns another 30% of D through C.

We could, of course, have defined enterprise groupings by assuming transitivity and multiplicativity. If we had done this, A would control D if the product (rather than the sum) of ownership links along either (not both) paths was greater than 50%. Under these assumptions, since $.55 \times .30 = .165$, we would not have found A exercising control over D.

Let us examine a "base" case where control was assumed to be exercisable if and only if greater than 50% of the voting stock was held. In this case, where firms have an "owner" or "owners" in common, fully transitively and additively within stages, they are said to be part of the same set of firms operating under common control. In the above diagram, for the base case we define A, B and C as part of the same enterprise; with A as the enterprise leader or "parent".

In general, most operational definitions of enterprise groupings will agree for cases of majority ownership. The definition of majority control we employed here is consistent with the main thrust of the literature. As a result, concrete differences among groupings (the specific inclusion or exclusion of a given firm within a defined enterprise) is not due in the main to theoretical or methodological differences, but to the use of slightly different data bases. As we will argue later on, the impact of these slight

^{23 -} Statistics Canada, Industrial Organization, op. cit., J.M. McVey, "The Industrial Diversification of Multi-Establishment Manufacturing Firms: A Developmental Study", Canadian Statistical Review, Vol. 47, no. 7, July 1972.

differences on top four and top eight concentration ratios is negligible. Definitions of control--such as one based on the "degree of nonresident ownership" however, which do not assume both transitivity and additivity within stages, will yield markedly different results. 25

DIRECTORSHIP, OFFICERSHIP, AND EXECUTIVE BOARD TIES

In the work reported here, we employed four different stipulative definitions of control under conditions of minority common stock ownership: more than 50% ownership and more than 15% ownership plus three directorship and/or officership ties in common; more than 50% ownership and more than 25% ownership plus three directorship and/or ownership ties in common; more than 50% ownership and more than 15% ownership plus three executive board membership ties in common; and, more than 50% ownership and more than 25% ownership plus three executive board membership ties in common. In each case, the networks of ties among firms were treated as fully transitive and additive within stages. Moreover, the direction of influence of a director/officership or executive board tie was assumed to follow that of the ownership relation. Any director/officer/executive board tie falling outside of ownership paths was disregarded.

We chose greater than 25% and greater than 15% ownership criteria for specific reasons. First, our data base consisted of CALURA reports; ²⁶ these contain information submitted by all firms above a certain asset size which must report holdings of 10% or more of domestic ownership and 5% or more of foreign ownership. We examined the enterprises using the assumption that 10% ownership (Larner's measure) meant control. Approximately 80% of the entire set of sampled companies were contained in one enterprise either as "owners" or "owned", under this definition! We could not, however, reject the hypothesis that this network of ties was generated by random forces: 10% ties generally do not reflect true

^{24 -} This definition is used in Statistics Canada, Inter-Corporate Ownership, (Ottawa: Information Canada, 1971).

^{25 -} Please note that this measure is multiplicative. Thus, if A owns B 90%, B owns C 90%; C owns D 90% and D owns E 90%, the stipulated proportion of control of A in $E=.9^4=.656$.

^{26 -} These are reports filed under the Corporation and Labour Unions Return Act (10-11 Elizabeth II) and reported in Statistics Canada's publication Inter-Corporate Ownership. Apart from this publication, we had access—through Statistics Canada—to the public information contained in the reports themselves. We are grateful to Nicholas Stosic, then of Statistics Canada, William Krause, and Peter Blitt, of the CALURA staff for their help in completing this study, and for innumerable acts of personal kindness as well.

underlying control in the Canadian data we examined. The network generated by greater than 15% ownership ties, however, was not simply stochastic. Changing our cut criterion to greater than 20% ownership did not appear to generate patterns significantly different from the 15% criterion, while the pattern at the greater than 25% level was marginally different.

Similarly, we examined the network of ties when companies were considered to be connected by directors/officers. The pattern of single director/officer ties was random. As a result, if we calculated enterprise groupings on this basis, they would have been random. This was not true for the pattern of two or more director/officer ties and it was less true of the pattern of three or more ties. Hence, we used three or more director/officer ties and more than 15% ownership as the minimum criteria for defining an enterprise.

In examining the control properties of ties, we distinguished between director/officers in general and members of the executive board. The latter, we maintain, are involved in the day-to-day operations of the firm, while the former may not be involved in detailed policy decisions. We wanted to empirically test to see if this distinction was valid.

METHOD OF CALCULATING ENTERPRISE GROUPINGS

In order to determine enterprise groupings, it was necessary to a) calculate both direct and indirect ownership patterns, and b) map director/officership or executive board ties into this matrix in such a way as to make these ties commensurable with ownership links.

Initially, our raw ownership files—consisting of a series of triplets (owner company; owned company; and per cent ownership)—had to be restructured into a series of lists, headed by ultimate owners (companies which own but were not themselves owned), which corresponded to paths along a given ownership chain. These chains were then merged by adding together the values for all equivalent chains (A owns B owns C and A owns C) and a cut criterion—corresponding to the point at which we could safely say a given company effectively owned another—was applied to these merged lists and the lists truncated accordingly. This procedure resolved the file into a series of sets headed by some ultimate owner ("parent") in which all ownership of the companies within the set (direct and indirect) was held to be vested in this ultimate owner.

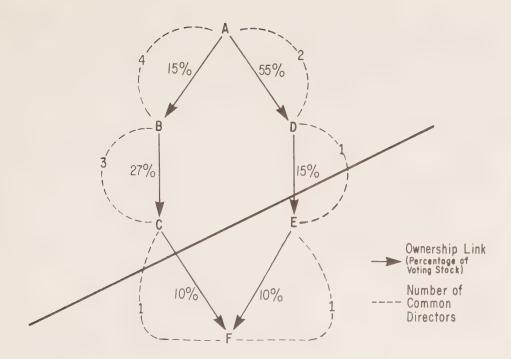
Initially, this cut criterion was fixed at more than 50%, corresponding to the traditional definition of "control". Director/officership ties or executive board member ties were then assigned a numerical value. This value was based on the assumption that, if stock ownership of "15% or greater plus three ties" was equivalent to control, the directorship ties, collectively, were

equivalent in value to a percentage ownership necessary to yield control, i.e., more than 50%. In this method of calculation, then, if we stipulated that 15% plus three ties constituted control, then one tie was equivalent to 12%.

This calculation was implemented by first identifying all director/officer or executive board ties which corresponded to an ownership tie of 15% or more. Each tie, when three or more were found, was then assigned a value of 12 surrogate percentage points. In order to eliminate the possibility that some fairly large ownership tie (e.g., 49%) might occur where only two director/ officer or executive board ties were present -- and thus would be excluded -- we also assigned each tie, where two or more existed, a value of 12. Consistent with our observation of the stochasticity of one-connectedness, we did not do this for single ties. More than three director/officer ties* were given additional weights of 12. This file of surrogate percentages was then merged with the actual ownership file, and assignments of firms to enterprises was calculated in the same fashion as they were for ownership at more than 50%. A similar method was used to calculate groupings using surrogate percentages at the 25% direct ownership level. Director/officer ties, because they were given surrogate ownership values, were treated as fully transitive and additive, as shown in the example below. A owns 15% of B and has four directors. The effective surrogate ownership of A in B is 15% +48% or 63%. controls B. Since B owns 27% of C and B and C have three directors in common, B is assumed to control C also with 63% effective ownership. A owns 55% of D directly. A's effective ownership in D is, however, 79%. Note that C does not control F, 10% ownership and one director in common not representing control. While A controls D, D does not control E; nor does E control F. In both these cases (D-E, E-F), the ownership and directorship patterns do not meet our minimum cut criteria for control. The resulting enterprise consists of A (as parent), B, C, and D.

In this way, even though assigned ownership values in a given instance might total more than 100%, it was possible to construct a single interval scale embodying both ownership and non-market ties. Because of the fact that we were interested in unambiguously assigning firms to enterprises, it was further stipulated that even after the value of this joint measure was greater than 50%, we would not make such an assignment if two or more "parents" existed. We therefore have a set of 49 "joint ventures"—firms we would not ambiguously assign to a single parent—as an outcome of our more sensitive definition, i.e., greater than 50% plus greater than 15% and three director/officer ties.

^{* -} In any case, this problem does not arise empirically.



JOINT VENTURES

In working with minority ownership values, multiple "parents" could exist. We determined a procedure to assign subsidiaries to their parents when a number of owners existed. We set a minimum value of Δ %. No firm (B) could be assigned to an enterprise (A) unless A "owned" B (where we include surrogate percentages for directors) by Δ % more than any other enterprise C, D, ...Z.

In order to calculate a value for \triangle , we first examined the minimum absolute value of the difference necessary for clear assignment at the 51% level. Where the value of all connections was less than 100% this was calculated as 2|A-C|, where A and C (as above) are competing ownership ties. At a minimum value A-C must be 2|51-49|. The minimum value for \triangle is then 4%.

By applying the same rule of thumb where the value of surrogate ownership may be greater than 100%, the generalized value for Δ may be calculated.

$$\Delta = 2 | A - C | - 2 (T_F/100) = .04T_F$$

where $\mathbf{T}_{\mathbf{F}}$ is the total calculated direct and indirect, surrogate and real ownership in a given firm.

Thus, where the value of a given tie for a firm B was greater than with A, but less than with any other complex C, D,..., we included B and its subordinates in the A complex. Where the value of the tie between firm B and all potential parents was less than \triangle , we classified B (and its subordinates) as a joint venture with the other complexes.

THE DATA BASE

In order to carry out this study, we required a data base that would include:

- A set of companies to examine (it would clearly be infeasible to examine the ties among all companies in Canada);
- 2. The ownership links among this set of companies;
- 3. The directors of each of these companies;
- 4. The officers of each of these companies;
- 5. The executive board members for each of these companies.

We detail below the specific sources we drew upon to construct this data base and any known errors or omissions in the sources. Two previous studies were of great value to us--the Berkowitz-Felt study of ownership and directorship links and the Waverman-Baldwin analysis of interlocking directorates. 27

SAMPLE OF FIRMS

Since it would not be feasible to examine all firms in the country, what companies should we include in our sample? The objective of our study was to examine the impact on concentration ratios of changing enterprise definitions. Therefore, we attempted to include detailed data on the "largest" firms operating in Canada in 1972, their parents and subsidiaries. We also attempted to locate firms which, while relatively small, play a salient or strategic role in articulating the relationships among the largest firms.

Defining the largest firms in Canada is a nontrivial task largely because of the existence of Crown and private companies. Private companies (companies owned by less than 50 shareholders) need not publish annual statements. Family-owned companies and many foreign subsidiaries are incorporated as private firms.

Waverman and Baldwin had listed 210 public firms among the largest 260 corporations in Canada in 1969. In examining their

^{27 -} The Berkowitz-Felt study assembled a data base consisting of the 1969 and 1972 CALURA data and some directorship data in machine readable form; as well as programs designated to handle them. Waverman-Baldwin examined the interlocking directors and officers among the largest 260 corporations in Canada in 1969.

list we found several cases where the firms were not incorporated in Canada, 28 and deleted these. We added 91 firms to account for above average growth for some corporations between 1969 and 1972 and to broaden coverage within these categories: banks, trust companies, transportation firms, utilities, industrials, merchandising firms and other financial institutions. 29

The basic sources (and those of Waverman and Baldwin) used in generating this list were:

- a. The Fortune Magazine listings of the leading corporations (both U.S. and "foreign") for 1972;
- b. Financial Post, Survey of Industrials;
- c. Financial Post, Survey of Oils;
- d. Financial Post, Survey of Mines;
- e. Financial Post, Survey of Funds;
- f. Moody's Transportation Manual;
- g. Moody's Industrial Manual;
- h. Moody's Banking and Finance Manual;
- i. Standard & Poor's Register of Corporations, Directors and Executives.

This list of 301 public companies was then augmented by 50 Crown and private non-Crown corporations and their operational subsidiaries determined in the earlier study by Waverman and Baldwin for 1969.30 Their procedure was to determine the 136 largest private companies derived from three groups of sources—the Fortune listing, the Financial Post Surveys and Conway, Supply & Demand for Corporate Securities. Some "obvious" candidates were included in the list of the largest 50 (Chrysler of Canada; Canadian Pacific Railway; General Motors of Canada; IBM Canada; Hudson's Bay Co.; Ontario Hydro, Quebec Hydro, T. Eaton Co.). The remainder were sent a questionnaire which asked: "At the end of fiscal year 1969, did your company have assets in Canada valued at \$80 million or more?" (\$80 million was the cut-off criterion to be placed in the top 200). Ninety-one firms responded and 25 of them were affirmative. Four Crown corporations were added: (C.B.C., Air Canada, Canadian National Railways, Polymer Corp.). Finally, 13 private firms were arbitrarily chosen from the 38 companies

^{28 -} The Waverman-Baldwin study, op. cit., inadvertently included several American firms which were not incorporated in Canada while they do trade here.

^{29 -} See Table A for list of these and all related companies in our sample.

^{30 -} Waverman and Baldwin, op. cit.

^{31 -} These data are published annually by MacLean-Hunter. The data used were for 1972 data year.

who did not respond to the questionnaire.32

In the Berkowitz-Felt study, ownership data on 6,000 firms had been placed in machine-readable form. ³³ These ownership data reproduced a sample of that contained in Statistics Canada's publication, Inter-Corporate Ownership for 1972.

The set of 361 largest public and private firms that we developed for 1972 was then used as a "pointer" to this larger file of ownership relations, tracing out all associated firms.

Of this set of 361 firms, 12 were not in the file created by the Berkowitz study. Missing ownership patterns were then researched from the Inter-Corporate Ownership publication; files of CALURA reports; Moody's Industrial Manual; Standard and Poor's Register; Security and Exchange Commission "insiders' report" on deposit at Harvard's Baker Library; Moody's Banking and Finance Manual; Moody's Public Utility Manual; private files; annual reports of companies; etc. 34

As a result of the integration of these files, anomalies were discovered in the data which then had to be resolved.

This research process located 4,944 additional Canadian or foreign firms associated either directly or indirectly with the 361 largest companies through ownership.

It was this bounded set of 5,305 firms which we used for all of our subsequent calculations. The stages in this sampling procedure are outlined below. Sample D represents our final set of 5,305 firms.

At this point, it was still possible for us to have missed some of the largest companies (private firms we omitted due to gaps in our process) or smaller firms associated with the largest (through gaps in information about small firms). These problems were corrected by Statistics Canada who, when they received an enterprise listing from us, included any corporations we had not detected due to gaps in public information. These discrepancies were quite small.

THE CALURA REPORTS

As we outlined above, our initial sample of the 361 largest firms in the Canadian economy was expanded to a sample of 5,305 by including all known direct and indirect ownership ties among these firms. The primary sources for our data on ownership ties among these were the Inter-Corporate Ownership publications.

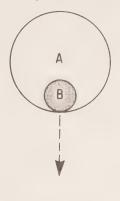
^{32 -} These inclusions were based purely on judgment. For example, all tire and rubber firms were included.

^{33 -} This data base was assembled under a contract provided by the Policy Analysis Group, Department of Consumer and Corporate Affairs, Ottawa, whose assistance is gratefully acknowledged.

^{34 -} The "Moody's" sources are all published in New York by Moody's Industries Service, annually. See the Bibliography for more detailed citations.

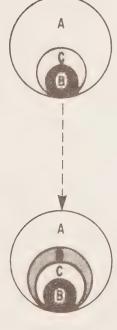
Stages in Selecting Sample of Firms

Stage 1



- The set of all firms in our data base.
- The subset of 283 largest public firms.

Stage 2



The set of the 361 largest C semi-private, Crown, and private companies.

Stage 3



The firms tied either directly or indirectly D with C through an ownership tie of some magnitude >10%

Our final sample: B+C+D=5,305Canadian and foreign firms.

Under the Corporation and Labour Unions Returns Act, (CALURA) all corporations chartered in Canada under federal or provincial laws -- whether public or private -- must file a return listing all corporations, trustees, etc., owning 10% or more of the voting stock of the corporation (if the owner is a domestic corporation -- 5% or more if the owner is foreign).

The CALURA data set was reasonably exhaustive for all ties among Canadian firms involving 10% or more of the voting stock (5% if a foreign owner) which are a) made within Canada, or b) made by a foreign parent only one removed from a Canadian subsidiary. The data however contained a number of flaws which had to be corrected before it could be used for our purposes. First, in a few cases, a firm was owned by several domestic firms, each having slightly less than 10% of the voting stock. These "separate" firms might however have been owned by a single parent on a higher branch. We therefore included some 30 additional domestic companies who controlled slightly less than 10% of the voting stock in other large Canadian corporations. For example, in the Nordex-Power Corporation group, several ownership percentages among members of the group were less than the CALURA reporting level. 35

A second flaw in the data was that nominees were reported as separate entities. A firm or individual may own perhaps 30% of a company, but divide this ownership among three separate or nominee accounts. Casual observation would indicate three separate owners where actually only one beneficial owner existed. It is obviously difficult to penetrate the nominee veil. We used several American directories of nominees to attempt to distinguish beneficial ownership but, obviously, without being able to ascertain their completeness. Therefore, it is possible that despite our efforts concentration is higher than we report.

Moreover, since the Inter-Corporate Ownership publication has not been produced by machine in the past, it contained errors which had to be corrected before we could define enterprise groupings. First, in approximately 60 cases, two different percentages were reported for the same "triple". Second, in approximately 20 to 25 cases, ownership of a company exceeded 100%, usually due to errors in the name of the firm (thus equating A. Smith Co. and A.B. Smith Co.) Third, this "naming error" occasionally generated loops in a chain of ownership. (A "loop" occurs where, for instance, A owns B; B owns C; and C owns A.) There were few cases of this, but they created havoc until altered. (All the errors we located and the additional data we discovered were reported to Statistics Canada.)

^{35 -} See footnote 26.

Finally—and probably most importantly—the CALURA data does not report the foreign parents of the foreign parents of Canadian corporations. For example, let us examine two Canadian corporations which were each owned by a separate foreign firm. The 1972 CALURA sources would then classify the two Canadian companies as "independent". However, if the two foreign firms were themselves owned by a third foreign firm, we would want them all to appear as part of the same enterprise. We thus had to augment the CALURA data set by including foreign connections not detected and reported in the Inter-Conporate Ownership publications. While we did search for all parents of the parents of Canadian firms, in one case discovering an "ultimate parent" ten steps removed from two Canadian firms, since the sources used were not documentary it is impossible to tell if this search was complete.

THE DIRECTORSHIP DATA

Once having determined our set of 5,305 ownership-linked companies we needed to detect all directorship and officership ties among these firms.

The basic source we used was Berkowitz's machine-readable file previously compiled from the Financial Post's Directory of Directors. Because the Financial Post sampling was far from exhaustive, data from other sources--primarily Standard and Poor's Register--were used to augment, supplement, and confirm data we already had.

The organization of the Financial Post Directory was one major source of these difficulties. It contains two separate lists of directors; the front half of the book lists directors and officers in Canada, alphabetically, and all the companies associated with each individual; the back half lists a number of companies alphabetically, and then all board members and officers for the companies, both Canadian and foreign residents. In a number of cases, the front half would list Ms. X as director of a company, yet the company list in the back would not contain Ms. X as a director. Where such problems occurred, we had to trace all companies and individuals and augment the Directory data for a) all foreign residents, and b) all Canadian residents who were inadvertently missed.

In some cases, we found genuine misreporting. All of our previous files had to be corrected where this occurred.

The Directory seems relatively error-free when dealing with the directors and officers of the major companies (all our public firms, but few private or Crown companies), and in tracing all the other directorships and officerships held by these same individuals; regardless of company size. For some other companies, the Directory appears to include only the major affiliations of their directors and officers and excludes affiliations with smaller firms. This creates problems when searching far down in ownership chains.

Private and Crown corporations are not well covered in the Directory. Since private firms need not publish names of directors and Crown companies are sparsely reported, we had to obtain this information from other sources--government reports, and provincial corporation files.

Whenever several different data sources are integrated, inconsistencies in the data sources surface. While we cross-checked these sources thoroughly, two potential errors need mentioning. The first we call the "John A. Jones/John A. Jones" problem: two men with the identical name. Since the Directory lists data by director, this problem was minimized. However, when integrating this information with sources that did not do this, we had to use other criteria to ensure that we had identified directors correctly, i.e., date, place of birth, etc. The possibility that we have incorrectly treated directors with the same name as the same person still exists. The second problem we were able to rectify, but only with a great deal of work: the "Bell Canada/Canada Bell problem". The data sources did not consistently give the correct legal name for the corporation --Bell Canada Co. Ltd. for example would appear as Bell Canada, Canada Bell, Bell Canada Co., Bell Canada Ltd. The data associated with each of these designations had to be made consistent with one another.

THE OFFICERSHIP DATA

We included in our data base the following officers for all companies: President, Vice President, Manager, Secretary Treasurer, Secretary, Treasurer, General Manager, Comptroller, Controller, professionals (legal counsel, medical director) and other officials. The *Directory* did not list all these positions for all companies. If a position was omitted for a particular company, we could not tell whether the firm had no such position, or whether the data were in error. We checked and augmented the Financial Post's data in a large number of cases, relying on detailed inspection of company reports and similar sources.

EXECUTIVE BOARD MEMBER DATA

Executive board members are defined as the officers and directors having the authority to act for the board of directors on a day-to-day basis. While the board of directors may meet only once a year, the executive board or committee members are usually in frequent contact. As we said earlier, it is generally believed that the pattern of ties among this group is substantially different from that among directors/officers not members of it. We undertook to test this belief. Unfortunately the Directory's listing of executive board members was incomplete and examination of company reports and prospectuses indicated that many firms simply did not report this information. Thus, for any company with seven or fewer directors, we assumed all

were on the executive board.³⁶ We then provided the Royal Commission with a list of all companies with more than seven directors, and the Commission sent these firms a questionnaire requesting the names and positions of executive board members in 1972. We incorporated the information they provided into our data files. In all relevant cases, we either were able to obtain these data from the Royal Commission questionnaires, or had access to them through some other source.

^{36 -} This was the mean number of officers/directors associated with the companies in our sample.



3. RESULTS

THE EFFECTS OF CHANGING ENTERPRISE DEFINITIONS ON CONCENTRATION RATIOS

Table A-1 lists the entire set of 5,305 companies gathered into enterprises. The first column of the table gives the company number (our code). The second column is the company's legal name. Column 3 gives the country of residence of stock control of the company: ³⁷ 1 if the U.S.A.; 2, U.K.; 3, other western OECD European; 4, all other countries (excluding Canada); 5, foreign country, not identified; 6, Canada; 7, unspecified (nominee, trust partnership). Column 4 is the code number from CALURA. Column 5 is the SIC code according to the Statistics Canada definition.

The next five columns list the number of the ultimate owner (enterprise number) of each firm according to each of the five criteria:

Column 6 - over 50% ownership

Column 7 - over 25% ownership plus director/officer ties

Column 8 - over 15% ownership plus 3 director/officer ties

Column 9 - over 25% ownership plus 3 executive board member ties

Column 10 - over 15% ownership plus 3 executive board member ties

The letters appearing after the enterprise number in these columns indicate whether the enterprise is a single firm enterprise (S), or a multiple firm enterprise (E). In cases where the firm is a joint venture, Volumes 7-10 list the company's own number with a letter (J) indicating that it is a joint venture.

The table was sorted according to column 8, i.e., by the definition of more than 15% ownership plus 3 director/officer ties. Thus it lists consecutively all firms which belong to a common enterprise by this definition, with the enterprise number given in this column.

Inspection across columns 6-9 therefore reveals how changing definitions change enterprise composition. In particular, moving across from column 8, which gives the most inclusive enterprise definition, to columns 7 and 6, which give progressively more stringent enterprise definitions, reveals how enterprises break into subenterprises as the definition is tightened.

^{37 -} The residence of the majority of shareholders in the company. This is not the same as the residence of the ultimate corporate controller according to our definition.

Let us take the first enterprise, 59, as an example. The parent is A.D. Janin and Co. Ltd. Under all but greater than 50% ownership criteria, it has 18 subsidiaries. Under the strict greater than 50% criterion one of the firms (2505, Carriere St. Maurice Inc.) splits off.

Table A-2 lists the companies alphabetically with owner number according to column 8 of Table A-1. As Table A-1 is arranged in ascending order of owner numbers in column 8, it is possible to locate any firm in Table A-1 by finding its owner number according to Table A-2. Going down column 8 of Table A-1 will locate the enterprise to which it belongs according to the 15% plus 3 director/officer definition. The individual firm can then be located by inspection of columns 1 and 2 of Table A-1.

In Table 3, we list 153 industries and concentration ratios defined on a strict greater than 50% ownership criterion. This table is based on Statistics Canada's definitions of enterprises, not our benchmark definition, and is used because Statistics Canada could not divulge to us the number of enterprises and establishments and the value of shipments by industry due to confidentiality restrictions. However, the differences between our benchmark, our four definitions and other firm concentration ratios, and the Statistics Canada values were less than 1% in all but ten or so cases. Consequently, the picture presented is more complete and coincident with our results. All changes in concentration resulting from changes in enterprise definition are however based on our benchmark values, not Statistics Canada's.

In twenty-four industries, the largest four enterprises control 79% or more of the industry value of shipments. In an additional 58 industries, the largest four enterprises produce between 50% and 78% of the value of shipments of the industry. In 122 industries the largest eight enterprises produced half or more of the industry's value of shipments. 38

In 1964 the Economic Council of Canada concluded that "... although more than one-half of the manufacturing industries for which reasonably comparable data were available over the period [1948-64] were more concentrated in 1964 than they had been in 1948, more than one-third had a lower level of concentration". 39

^{38 -} In our earlier discussions we alluded to the problems in the CALURA definitions of control. An illustration is in order. According to table A-1, based on Statistics Canada's criteria, there are three industries where the largest four firms produce 100% of industry shipments. According to CALURA criteria, no such industries exist.

^{39 -} Economic Council of Canada, Interim Report on Competition Policy (Ottawa: Economic Council of Canada, 1964), p. 81.

In its study of concentration in 1968, Statistics Canada suggested "...that aggregate concentration within manufacturing appears to be slightly declining [between 1965 and 1968],..." 40

At the time of working this report, Statistics Canada had not released their analysis of the 1972 concentration levels, but a similar pattern may be observed here.

We now turn to examining how altering the definition of what constitutes the enterprise alters the measurement of concentration.

Table 4 gives an array of simple differences between the top four and the top eight concentration ratios compiled according to the four enterprise definitions and those compiled according to the benchmark greater than 50 per cent enterprise definitions. Table 5 gives the same arrays for the relative differences between the different definitions. Because of confidentiality restrictions it was not possible to identify the industries in which these changes occurred. Consequently, the arrays are sorted into ascending order to value rather than by industry. It is therefore not possible in some cases to identify the changes in concentration due to definitional change across the same industry.

In order to evaluate the importance of the changes in concentration revealed by Tables 4 and 5, Table 6 groups industries affected into those with less than 30% concentration by the top four enterprises; between 30% and 44% and between 45% and 80%. For each of these categories, weighted and unweighted means of the simple and relative differences in the top four and eight concentration ratios for the four special enterprise sets and those for the benchmark concentration data are calculated. Table 7 gives the weighted mean and standard deviation (unweighted deviations from weighted mean) of the top four and top eight concentration ratios by the benchmark and the alternative definitions.

Examination of Tables 3 and 4 suggests that weak ownership ties (i.e., less than 50% direct ownership) play a very limited role in the case of horizontal connections in the manufacturing industry. Changes in ownership definitions affected at most only 8 out of 153 manufacturing industries. Even in these, there is no change at all when enterprise definition is loosened from 25% ownership plus criterion to the 15% ownership plus criterion. That is, where changes occur, they are the result of a significant amount of ownership (over 25%). Apparently, given the visibility of ownership/directorship ties, they are generally not used as a means of establishing communication and control within a cartel. This observation is supported by the fact that the main impact of the definitional changes is in industries with low to moderate concentration.

^{40 -} Statistics Canada, Industrial Organization and Concentration in the Manufacturing, Mining and Logging Industries (Ottawa: Information Canada, 1973), p. 16.

Table 6 shows that the main differences occur in industries where the largest four enterprises have less than 44% of the industry's output. Concentration ratios rise by an unweighted average of 2.6 percentage points for those industries with less than 30% concentration and by 3.9 percentage points for those with less than 44% concentration, but only by an average of 1.5 percentage points for the three industries affected which have a concentration ratio of between 45% and 80%. Moreover, comparison of the weighted and unweighted means of the effects of definitional changes suggests that relatively small industries are involved in those shifts. This observation is supported by Table 5 which shows that the weighted mean of concentration ratios for total manufacturing rises from 50.35 when a 50% ownership definition of enterprises is used to 50.65 when 25% or 15% plus three director/officer definitions are used, an insignificant increase when compared to the standard deviation of about 23%.

The effect of changing definitions of control on the top four concentration ratios appears to exceed, in most cases, that of the top eight ratio (Table 4). This suggests that levered ownership control is mostly used by the four largest firms in the industries affected in expanding horizontally by acquiring smaller corporations, at least some of which are members of the next largest four. Thus, these observations suggest that some levered ownership is used in the consolidation of market shares by the larger corporations operating in relatively nonconcentrated industries. This makes sense because in such industries anti-combines laws are not completely operative.

It should be pointed out, however, that the effects of changes in control definitions have only been traced for manufacturing industries. Inspection of Table A-l suggests that a large number of cases in which changes in the definition of enterprises cause significant changes in enterprise composition occur in industries other than manufacturing. In particular, a large number of these changes occur in mining and among financial institutions. It is therefore likely that the effects of ownership leverage on concentration in these industries may be considerably more marked. However, in the absence of the basic concentration data for these industries, we are unable to verify this hypothesis.

OWNERSHIP LEVERAGE

The most striking result of our study is the low degree of leverage in Canadian intercorporate ownership: very few corporations appear to control others by holding minority shares. Moreover, most ownership ties emanating from non-financial institutions involve 100% ownership. By contrast, fairly extensive ownership leverage is shown by two large conglomerates, Argus Corporation Ltd. (whose parent is Ravelston Corporation Ltd.) and Power Corporation of Canada Ltd. (whose parent is Nordex Ltd.) as well as financial institutions

(e.g., trust companies) which frequently have a significant, though less than 50% share of holding companies. The owned holding companies, in turn, do not generally exhibit high leverage and appear to own at least 50%--and in many cases 100%--of the shares of the companies controlled by them.

Even in those cases where minority share ownership is associated with control by our definition, relatively little ownership leverage is used. This is evident by inspection of the results of Table A-1. Very little difference in the composition of enterprises is exhibited when their definition is broadened from 25% to 15% ownership.⁴¹ This is true whether the management tie is defined by directorship/officership or by executive board membership. In fact only very few substantial changes in major enterprises occur in either of these cases.

The major exceptions are as follows: (a) the Massey Ferguson group of corporations and Dominion stores both form separate enterprises according to either the 25% ownership-plus or the over 50% definition, but become members of the Ravelston Corp. enterprise according to the 15% plus-ownership criterion; (b) a group of companies owned 100% by Dome Petroleum forms a separate enterprise by the 25% ownership-plus criterion, but joins the Dome Mines enterprise (which owns 17% of the shares of Dome Petroleum) when the ownership criterion is reduced to 15% plus.

About 30 substantial changes in major enterprises occur when the control definition is changed from 50% ownership to 25% ownership plus. This pattern—thirty substantial changes out of 5,305 companies—shows that the use of pyramiding in the structure of the largest 360 Canadian firms is minimal. The majority of these changes involve either a "single tie" between two holding companies or a financial intermediary (such as a trust company) owning between 25-49.9% of a holding company. These changes also appear more frequently in the mining and oil industry than in other manufacturing areas, suggesting a higher degree of ownership leverage in mining and oil.

An example of the first case, the single tie between holding companies, is the group of companies the majority of which are 100% controlled by Distillers Corporation, Seagrams. These form a separate enterprise according to the 50% ownership criterion. However, when the ownership criterion is reduced to 25% plus three ties they become a part of the enterprise controlled by CEMP Investments which controls 32% of the shares of Distillers Corporation, Seagrams Ltd. An example of the second case, leverage in the mining and oil industries, is the enterprise controlled by Noranda Mines Ltd., which is a separate enterprise according to the 25% ownership

^{41 -} In all subsequent discussions, the control criteria defined as the over 15% or over 25% ownership plus three interlocks will be called the "15% ownership plus" and the "25% ownership plus" definition.

plus three ties criteria. When the ownership is changed to 50%, this enterprise breaks up into several single companies and other sub-enterprises (such as the groups controlled by Kerr Addison Mines Ltd. or Placer Developments Ltd.).

There are relatively small differences between enterprises whether we use directorship/officership ties or executive board ties. Most, though not all, director or officer ties used to maintain control are made through members of the executive boards. However, in some cases, significant control is maintained by directors/officers who are not also members of the executive board. This is true, for example, for Noranda Mines Ltd., which owns 26.5% of Placer Developments Ltd.'s shares and controls it through directors/officers who are not members of the executive board.

As executive board members are almost always directors or officers, there are few cases where the definition of ownership by executive boards is more inclusive than that obtained by director/officer criteria. 42 However, a notable exception is the case of the Weston group where the W. Garfield Weston Charitable Foundation owns 49.7% of the shares of George Weston Ltd., but is not listed as owner of George Weston Ltd. by the director/officer criterion. Control here is exercised through executive board members who are not listed as directors/officers.

In a few cases, where director/officer ties suggest control but executive board ties do not, outside information suggests that control is in fact absent. These appear to be "joint ventures" so that the apparent control by one firm via directorships is actually shared controls with one or more large partners. An example is Frandevcor Explorations, Frandevcor Investments Ltd., and Frandevcor Ventures Ltd. which are controlled by Credit Foncier Franco-Canadienne by the director/officer criterion but are in fact joint ventures according to the executive board criteria.

In general, we are satisfied that our definition of enterprises based on a minimum of 15% ownership plus three director/officer ties is the most reliable measure of control. Although the differences in enterprises between this definition and the 25% ownership plus criteria are not numerous, they are important. While it is possible that the measure defines control in some questionable cases (where executive board ties suggest lack of control), companies with acknowledged control are clearly brought together. They are not brought together by other definitions.

^{42 -} Note that where no executive board exists separately from the board of directors, all directors/officers are assumed to be members of the executive board.

We cannot offer definitive explanations of the observed patterns of ownership and management ties. The economic theory underlying such ties is almost nonexistent, and extensive empirical analysis is beyond the scope of our undertaking. However, we shall attempt to suggest some explanations based on existing theory and our observation of the data.

AN EXPLANATION OF CONTROL AND OWNERSHIP PATTERNS

The inclusion of a number of firms within an enterprise may be a result of some relatively accidental factors or of conscious decisions on the part of those managing an enterprise. These are, of course, not independent of one another; historical ownership patterns can be modified to suit management. However, such modifications take time and effort so that, at any point in time, temporary "bargain" acquisitions will interact with management structural decisions to yield a transitional nonequilibrium picture of the enterprise. These considerations introduce a great deal of "noise" into any patterns which may be revealed by economic analysis. Nevertheless an analysis of the determinants of enterprise structure should yield some insight into the observed patterns.

The determinants of enterprise structure are similar to the determinants of firm structure, the difference being the incorporation of separate entities for enterprises. Theory suggests that firms will be established where complementarities of activities among constituent parts is such that command chains must be substituted for market relationships. In cases where the output of any member of the firm depends on that of other members, and where measurement of their effects is difficult, it is necessary to set up rules by which operations will be carried out and rewards allocated rather than leave the matter for negotiation. On the other hand, a limit on the size of organizations is imposed by the complexity and diversity of tasks to be performed. These factors determine the optimal size of operating divisions of a company and the degree of autonomy allowed them. In general, one would expect the number of divisions to be directly related to the size of the enterprise and the diversity of its operations: the greater the size and diversity, the greater the number of divisions and the greater their autonomy, i.e., the greater the reliance on market forces in coordinating their activities. This diversity may result from technical factors (producing different products which are not substitutes in production) or geographical factors (operating in geographically different markets). It is clear that, given the size of the country, Canada's geography will generally cause a proliferation of divisions. On the other hand, the small number of consumers relative to the efficient size of plant organization may result in a pattern in which relatively unrelated operations are housed under one divisional roof so that the management capacity is properly utilized. None of these arguments, however, suggest why divisions tend to be incorporated separately.

Financial flexibility in terms of dividends and other financial considerations, as well as limited liability, make it attractive to incorporate operating divisions separately. Tax considerations may also act to increase the tendency towards separate divisional incorporation. 43 Consequently, we may expect that the factors contributing to firm diversification and size will also lead to the proliferation of firms within enterprises. Also, historical accident is likely to cause operating divisions to be separately incorporated even in cases where optimal institutional design would not favour incorporation. This occurs in cases where enterprise growth was achieved by way of acquisition rather than internal expansion. In such situations absorption of an acquired firm into the legal framework of another may be hampered by legal and other costs of reorganization and the costs may be sufficiently high to offset the savings from amalgamation. Alternatively, acquisition may have been incomplete due to difficulties in securing 100% ownership of the firm in question so that amalgamation was prevented. We should therefore expect enterprises to be composed of separately incorporated firms, even where ownership is 100%. It is clear that where ownership is partial, separate corporate entities are required. This is true even in the case of absolute control of one firm by another.

As we have previously seen, size and diversity of enterprises should be directly related to the number of firms that constitute the enterprise. These should also affect the form of ownership and management ties.

Consider first size. To achieve larger size for an individual group will generally require dilution of control because resort to the bond market is limited by the amount of equity that can be generated by the group and increases in equity can only be achieved by dilution of control of the original group. One device that is commonly used to increase the size of an enterprise without diluting control of the management is "ownership leverage" or, at the extreme, "pyramiding". In this case, a small group of shareholders owns a sufficient number of shares to control a holding company which, in turn, holds sufficient shares to control a number of other companies. For example, owning 25% of floating stock could give complete control of a set of operating companies through control of 50% of the operating companies. In the case of pyramiding, this ownership leverage could be increased by simply adding another holding company as an intermediary between the holding company and the operating companies. In this manner, only 12.5% of equity capital would be required to control the operating companies.

^{43 -} Separate incorporation increases the proportion of profits subject to lower corporate tax rates. Also tax considerations make separate incorporation more valuable in case of bankruptcy.

In order for ownership leverage to be effective, the management capacity of the controlling group must exceed the funds they invest. Unless they demonstrate their ability to generate sufficiently high profits, the demand for shares in the holding companies will not be sufficient to generate the appropriate leverages required for expansion. One basis for expansion is retained earnings: the higher the amount of internally generated funds, the greater the ability of corporations to raise money by bond and other non-controlled issues (the greater is their debt capacity). In addition, a firm with a proven track record of high profits is a good credit risk. Thus, the past profitability of a firm is a major determinant of its ability to expand.

In this sense, the ability to expand is limited by the past experience of the levering group. Only exceedingly successful groups can lever very highly. Another limiting factor on the ability to lever is absolute size. To maintain control of small corporations requires over 50% ownership; otherwise other groups can find sufficient funds to buy a large block of shares and acquire control. As the absolute size of an enterprise grows, it becomes progressively more difficult for other groups to acquire large blocks of shares. Consequently, a smaller percentage of the voting shares is required to control a large corporation than to control a small one. It is therefore clear that only the larger corporations would have situations in which control was exercised by less than 50% of the shares. This is probably one of the major reasons for the lack of ownership leverage in the Canadian economy: the number of potentially large corporations with sufficiently good management that can attract funds by way of ownership leverage is limited by the size of the Canadian economy (as well as by the quality of local entrepreneurs).

Ownership leverage and profit maximization for the controlling group may or may not be consistent with each other. Where economies of scale prevail or when large size is required to obtain monopoly position, leveraged ownership may be required in order to acquire maximum profits for the controlling group. However, if the controlling group can obtain the necessary amount of capital for expansion without ownership leverage, it does not pay them to allow others to share in the excess profits. Again, the small size of of the Canadian market enables groups of entrepreneurs to obtain scale economies or monopoly profits without sharing them with others (through ownership leverage). This is probably one of the reasons for the preponderance of 100% ownership ties.

However, this argument is true only for new acquisitions. That is, when a company wishes to purchase another one in order to realize excess profits, 100% ownership is necessary in order to appropriate all profits. However, once the purchase has been completed and excess profits are realized these are capitalized in the price of shares. The controlling company may now sell some shares while maintaining control and using the capital obtained by

these means for further expansion. The appropriation of monopoly profits cannot therefore be a major explanation of the preponderance of 100% ownership ties. To understand these we must come back to the question regarding the nature of the diversification and expansion process of firms. As suggested before, many of these 100% ties between firms result from complementarity in the operation of various companies which makes it attractive for these firms to operate under common control.

THE DIVERSIFICATION AND EXPANSION OF FIRMS

There are two major avenues of expansion open to firms:

- a. They may expand within the narrow confines of an industry, increasing their share of industry input.
- b. They may choose to expand outside their industry into related industries or into entirely different lines of endeavour.

Expansion Within an Industry

There are two major reasons for expansion within an industry:

- 1. Economies of scale that reduce operating costs as scale is increased. In this case expansion is likely to take the form of growth within firms rather than the creation of new firms because fairly tight control is required in order to obtain the benefits of scale.
- 2. Expansion for the attainment of some degree of monopoly. If a firm is large enough relative to the size of the market, combination with rival firms will reduce the degree of rivalry and increase the degree of monopoly enjoyed by the combining firms. Expansion by amalgamation to obtain a monopoly position is fraught with legal problems because of anti-trust regulations, although in Canada these have not been enforced very vigorously. Obtaining control via minority interest may be a substitute for total amalgamation depending on how anti-trust authorities view minority control. Until Phase I of the recent Anti-Combines Act, it was not illegal to interlock directors or executives with competitors. Thus, minority control, plus interlocking directorates, may be used as the means of directing the operations of a cartel. However, such arrangements are not likely to be too prevalent because directorship ties are much too visible. The only case of such ties we have been able to discover occur in the pulp and paper industry. Although, of course, there is no way of proving that they are in fact used for maintaining a cartel, it is clear that they are bound to serve as a channel of communications among firms in the industry. 44

^{44 -} See Waverman and Baldwin, op. cit., for an elaboration of this point.

Another avenue for maintaining communications and cooperation within an industry involves the undertaking of joint projects among members of the industry. These joint ventures may be in the industry itself or in vertically related industries. Their anti-competitive effects are unclear. On the one hand, they signal that two or more firms have sufficient agreement on price and demand that they can install capacity together. On the other hand, any one single firm may be small relative to the magnitude of the specific investment. Such arrangements are common in the oil industry where capital requirements are sufficiently large to require consortia of several companies (as in tar sands and pipeline investments). Forty-nine joint ventures were found under the criterion of 15% ownership plus three director/officer ties (where joint ventures are defined as firms having two parents where ownership percentages are calculated on the surrogate basis). Many of these joint ventures are "multiples", the same two parents owning more than one subsidiary jointly. For example, Simpsons Ltd. and Sears Roebuck and Co. (U.S.) own 6 firms jointly; Canadian Cable System Ltd. and Gulf and Western Industries Inc. (U.S.) own 19 theatres jointly.

Expansion Outside an Industry

There are five major, but not necessarily mutually exclusive reasons, for expansion outside the confines of the industry in question, i.e., diversification. The first three involve expansion into market activities related to those of expanding establishments. The fourth and fifth do not.

- 1. Excess capacity. The optimal size of at least some of the components of an enterprise may exceed the size of the relevant market. In such cases expansion into related activities utilizes full capacity which otherwise would not be utilized. Consequently, the cost of such expansion is reduced. Major examples are "overcapacity" of management or of marketing facilities. Thus, for example, the establishment of dealership networks for the distribution of automobiles can also be used to sell credit associated with automobile purchases and spare parts. Consequently, auto manufacturers will expand their activities in these directions. The availability of intangible capital that is not fully utilized in the enterprise's current operations can be thought of as excess capacity in the same sense as excess capacity in management or marketing. Perhaps the most important example of an intangible is a trademark that can be used for a related product. In particular, advertising which is used to promote trademarks can sell a variety of related products at significantly reduced cost per product. Thus, for example, manufacturers of vacuum cleaners expand into other electrical appliances, manufacturers of toothpaste into toothbrushes.
- 2. Bilateral Monopoly. This is a situation where a seller who possesses some degree of monopoly confronts a buyer who possesses some degree of monopsony, i.e., one or just a few sellers confront one or just a few buyers. To maximize profits, sellers will attempt

to charge a price which will set marginal cost equal to their marginal revenue. If the product is an input into the production of another product, buyers will limit their purchases to that quantity which will equate the marginal revenue of the input product to its marginal cost. These two positions are inconsistent: that is, the price demanded by the seller for each quantity is different from the price which the buyer is prepared to pay for the same quantity. Equilibrium will not be achieved automatically. The difference will have to be resolved by bargaining. In any case, the resulting price of the factor is likely to exceed its marginal cost. Consequently, buyers will tend to underutilize it, substituting other factors in the production process as much as possible. While the price arrived at by bargaining may yield excess profits to both buyer and seller, their combined profit falls short of that which would accrue to a unified enterprise. This is because a unified enterprise will consider the true marginal cost of producing the factor as its marginal cost and maximize profits with respect to it. It therefore pays to eliminate such bilateral monopoly positions by some form of amalgamation. Examples are: newspapers and pulp and paper companies, automobile and steel producers, etc.

3. Vertical Extension of Monopoly Power. If is often stated that monopoly power can only be used once. It does not pay for a monopolist, because of it, to purchase the competitive producers of imports or to expand into the production of the final good. However, it can be shown that a non-integrated monopolist is in fact better off in some circumstances when he does integrate vertically. This occurs when a manufacturer possesses some degree of monopoly in the manufacturing of a final good but does not own any marketing channels. If the marketing industry is fully competitive, the monopolist can price discriminate only to the extent that he can sell at different prices to wholesalers. But wholesalers are large, well-informed buyers, and it is unlikely that a discriminatory pricing scheme could be maintained. The same is not true for final consumers--especially for products which are purchased infrequently. It would therefore benefit the monopoly manufacturer of optical glass, for example, to monopolize all the retail outlets for glasses in order to practice price discrimination.

Another reason for vertical expansion occurs in the case of oligopolistic producers of undifferentiated products. Such producers are very vulnerable to price competition or technological developments. By expanding into marketing—developing brand names and differentiating the product by way of advertising—such vulnerability can be reduced. For example, integration forward into retailing benefits producers of gasoline, which is an undifferentiated product in the barrel. In addition, non-price competition tends to generate longer lags in competitors' responses than does price competition. Therefore, integration into retailing provides another possible advantage for gasoline producers: price discrimination based on a differentiated product.

- 4. Diversification for the Purpose of Reduction in the Risk of Investments. Expansion of the firm can take place in areas outside its primary specialty and vertically related activities. When there are no relationships among the products or the techniques used to produce them, the firm is a pure conglomerate. Diversification into conglomerate activities can serve a number of purposes: first, where the profits of the separate activities are unrelated, diversification can reduce the variance of the firm's profits. Second, a firm with large retained earnings and limited possibilities for expansion in activities related to its primary specialization can pay out higher dividends or expand as a conglomerate. Because capital gains are taxed at lower rates than ordinary income, shareholders would prefer capital gains over dividends. As a result, the growth of enterprises made up of unrelated activities may be partially due to existing tax laws.
- 5. Financial Intermediaries. In a number of cases, financial intermediaries are parents of enterprise groupings. This is not surprising, since finance companies are in the business of investing. For example the Bank of Montreal has controlling interests in Bankmont and Company, Barlow and Company, Lake and Company, and Summont and Company; all nominee trusts. The Canadian Imperial Bank of Commerce has a controlling interest in Dominion Realty Co. Ltd., McKinnon Properties Ltd., Stornoway Investments Ltd., Gee and Co., Gore and Co.; the latter two being nominees. Cornat Industries Ltd., a holding company, controls Coronation Credit Corporation Ltd., several other credit companies, and several firms in freezing and storage and freight. The Royal Bank of Canada owns over 50% of the stock in other firms, five of which are nominee trusts, four resource firms and one development company. The Toronto Dominion Bank, on the other hand, owns 50% of only one firm (Bantor and Company), but controls three others--Edmonton Centre Ltd., Toronto Dominion Centre Ltd., and Pacific Centre Ltd.--under the 15% (or 25%) plus three director/ officer criteria.

Financial intermediaries are not then major enterprise leaders. They do not own many other firms or diversify into nonfinancial areas. There are some horizontal links between financial intermediaries (banks and mortgage companies); however, acquisition of direct competitors is largely illegal. Moreover, because of restrictions on the nature of their investments, they are constrained from forming large enterprise groups.

As we mentioned earlier, the set of connections defined by single director/officer links did not show any clear, nonrandom pattern. Over 50% of the single director interlocks between the 5,305 firms are between industrial firms on the one hand and financial intermediaries on the other. These ties exist not for control but for a variety of other reasons: first, in imperfect capital markets, borrowing in times of financial stringency may be determined by a firm's connections. Industrials may therefore desire directors or officers of financial intermediaries as outside directors. Similarly, a bank in making a loan may request an interflock, hoping that the information it thus gathers will help safeguard

its investment. Another reason is that, since the fixed costs of handling an account is almost the same no matter what its size, financial intermediaries may desire to interlock with large profitable industrials as a means of obtaining their accounts. Note that in none of these cases is ownership or control required. As a result few industrial enterprises defined on strict control grounds have major financial intermediaries as components.

FORMS OF TIES

The first three reasons for expansion discussed in the last section yield guite different patterns than the last two. They also require a different form of ownership and management ties. However, in the first three cases, in order to maximize joint profits, transactions among the members of an enterprise require marginal cost pricing rules which are different from those adopted by independent corporations, thus lowering the prices of the services sold between firms. However, prices will, of course, reduce the apparent profits of firms selling the services and increase those of firms buying them. Unless both members of the enterprise are owned 100%, profits will be transferred from shareowners of the sellers to those of the buyers. It is clear that less than 100% ownership of the buying company is not advantageous as it allows outsiders to share in excess profits. Further, minority shareholders in the selling companies are bound to feel cheated and resort to the courts. Because, in most cases, a market price for a disputed item does not exist apart from the transfer price, it is not an easy matter to determine a transfer price that will satisfy minority shareholders even if the buying corporation can use the correct marginal cost price in its operations. Consequently, in all such cases, there will be a tendency for the enterprise to own 100% of the shares of the operating companies connected for these reasons. Therefore, where ownership leverage is required to obtain a desired size, it is exercised by a holding company holding another company which in turn controls 100% of the operating companies (where their operations are related in one of the first three ways outlined above).

This is clearly not the case for the "pure" conglomerates that operate to diversify their retained earnings. For them, problems of transfer pricing or extension of monopoly power do not arise. As a result, 100% ownership is not necessary. Nor is 100% ownership necessary to generate informational flows necessary for short term financial arrangements.

FOREIGN OWNERSHIP

So far, we have dealt only peripherally with the effects of foreign ownership. Theory and statistical evidence indicate that foreign investment generally follows the patterns set by the first three reasons cited above and most foreign parents expand their

activities in the home countries or in related lines. The rationale that 100% ownership is required is even stronger for foreign corporations than for Canadian ones. This is because, in many cases, transfer pricing occurs between foreign parents and Canadian subsidiaries. Therefore transfer prices, besides determining relative profits of buyers and sellers, also determine tax liabilities in the respective countries. Disgruntled minority shareholders therefore have a much higher nuisance value since they can raise tax questions in addition to generating equity problems.

In addition, foreign parents, particularly those from the United States, have access to capital markets in the United States. As the cost of funding in the United States is generally somewhat lower than in Canada, it pays these firms to raise ownership capital in the United States rather than in Canada. Moreover, the large size of parent corporations enables their managements to increase ownership leverage, without losing control. As pointed out before, the small size of Canadian subsidiaries increases the risk of control loss that may result from increased ownership leverage.

Consequently, we should expect a strong tendency of foreign ownership ties to take the form of 100% ownership. We have not been able to perform statistical tests of this proposition due to lack of data on assets or sales. However, inspection of Table A-l suggests that our reasoning is correct.

^{45 -} Cf., R.E. Caves, Diversification, Foreign Investment, and Scale in North American Manufacturing Industries (Ottawa: Information Canada, 1975)

TABLE I

WEIGHTED MEAN AND STANDARD DEVIATION (UNWEIGHTED DEVIATIONS FROM

WEIGHTED MEAN) OF TOP 4 AND TOP 8 CONCENTRATION RATIOS

ACCORDING TO SPECIFIED ENTERPRISE

DEFINITIONS, MANUFACTURING INDUSTRIES,* 1972

	Weighted Mean	Standard Deviation
Top 4		
Benchmark measures A B C D	50.34974 50.65856 50.65856 50.59796 50.57469	23.59684 23.56086 23.56086 23.57939 23.58827
Top 8 Benchmark measures A B C D	63.24774 63.51049 63.51049 63.47005 63.53071	24.85392 24.81424 24.81424 24.82853 24.82497

^{* -} Cf. Statistics Canada, Standard Industrial Classification Manual, Cat. No. 12-501, Occasional (Ottawa: Information Canada, 1970) for the definitions of these industries. For details, see Table 3.

Notes

The definitions referred to are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

SPECIFIED MEANS OF DIFFERENCES BETWEEN THE FOUR SPECIAL SETS

OF ENTERPRISE DATA FOR THE MANUFACTURING INDUSTRIES AND

DATA COMPILED FOR BENCHMARK COMPARISONS

Weighted mean of the relative differences between the top 4 and top 8 concentration ratios for the four special enterprise sets and those for benchmark concentration data:

			op 4 efin:							Ratio ition	
		A	В	С	D			A	В	С	D
Less than 30-44% 45-80%	30%	7.6	9.0 7.6 2.4	7.5	7.5			3.8		4.6 3.5 1.7	
Number of	industr	ies :	in th	ne ce	ells	of	the	abo	ove :	matric	es:
Less than 30-44% 45-80% plus	30%	2 3 3 -	2 3 3 -	2 2 2 -	2 2 3 -			2 3 3 -	2 3 3 -	2 3 2	2 3 3 -
Total		8	8	6	7			8	8	7	8

Notes

The definitions referred to are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

Benchmark data are based on use of the greater of the CALURA or Policy Analysis 50% shareholdings code or, if the benchmark so defined is confidential, by the regular McVey code if 1% or less diffrent from the benchmark concentration ratio otherwise applicable.

TABLE 3

CONCENTRATION RATIOS - BENCHMARK CASE* (STATISTICS CANADA DEFINITION*)

Percentage of Value of Shipments of Goods of Own Manufacture Accounted for by the Leading 4 and leading b Enterprises, by Industry, 1972 Census of Manufactures

			% of Industry Value of shipments			
S.I.C.	Industry		Establishments ber	Shipments	4 Leading Enterprises	Enter; rises
0311	Pulpwood logging	825	872	616,091	33.0	53.2
0319	Logging, n.e.s.	1,821	1,925	1,256,416	37.9	4).3
0510	Placer gold mines	15	15	164	59.5	\$7.1
0520	Gold quartz mines	14	23	103,324	62.8	89.7
0570	Uranium mines	3	3	79,259		
0580	Iron mines	13	17	465,457	74.1	90.4
0591	Copper-gold-silver mizes	29	53	774,624	€5.6	83.4
0592	Nickel-copper mines	10	11	865,464	x	х
0593	Silver-cobalt mines	Z _k	4	4,541	100.0	
0594	Silver-lead-zinc mines	13	16	339,840	88.5	97.7
2595	MolybJenum mines	4	4	22,751	100.0	
0599	Miscellaneous metal mines, n.c.s	7	7	24.233	77.5	* * *
0710	Asbestos mínes	9	12	224,756	83.1	х
0720	Peat extraction	52	57	15,326	45.1	60.6
0730	Gypsum mines	6	10	19,003	×	х
0791	Soapstone and talc mines	4	4	1,603	100.0	
0792	Feldspar and quartz mines	8	13	14,482	91.4	100.0
0794	Potash mines	8	8	138,829	69.6	100.0
0799	Miscellaneous non-metal mines, n.e.s	13	14	16,219	76.3	94.4
0830	Stone quarries	101	122	84,261	26.3	38.8
0870	Sand pits or quarries	134	155	68,756	31.4	42.9
1011	Slaughtering and meat processors	415	468	2,551,415	53.9	62.0
1012	Poultry processors	78	98	358,534	38.2	54.2
1020	Fish products industry	258	350	444,494	42.5	54.4
1031	Fruit and vegetable canners and preservers	170	215	523,353	39.7	55.9
1032	Frozen fruit and vegetable processors	32	32	107,967	60.5	78.2
1040	Dufry products industry	498	731	1,573,723	33.0	45.8
1050	Flour and breakfast cereal products industry	31	50	319,274	66.8	85.3

^{**} See text for discussion of differences between benchmarks.

Percentage of Value of Shipments of Goods of Own Manufacture Accounted for by the Leading 4 and Leading 8 Enterprises, by Industry, 1972 Census of Manufactures

No. No.	% of Industry Value of Shipments		
1571 Biscult canufacturers 32 43 167,834 73.4 1672 Takeriko 1,705 1,768 540,371 33.4 1572 Takeriko 1,705 1,768 540,371 33.4 1573 Confectionery munufucturers 118 124 258,955 49.3 1174 Cone and beet sugar processors 7 14 267,472 93.7 1673 Vecesuale est citie 160 10 160,001 75.5 1635 Missellaricus follographic measurements 23/ 281 905,876 35.2 1647 Suft dirit constacturers 361 363 412,921 46.2 1679 Distilleries 14 29 443,369 79.7 1679 Distilleries 7 42 484,770 96.5 1674 Vineries 20 28 63,808 63.9 1510 Ivan tebacia follographic measurements 6 10 174,812 x 1530 Tobacco products manufacturers 11 17 421,424 97.1 1620 Subber projects industries 86 104 722,630 60.6 1659 Plastics fabricating industry, m.e.s. 542 590 594,682 13.3 1720 Leather tunnetics 22 30 81,933 78.5 1740 Shae factories 151 171 252,354 24.1 1750 Leather glade factories 42 46 20,257 40.9 1762 Foot and shoe findings manufacturers 26 32 18,921 64.2 1779 Miscellaneous leather products randiacturers 26 32 18,921 64.2 1779 Miscellaneous leather products randiacturers 164 164 73,669 20.4 1810 Cotton yarn and cloth mills 9 27 309,607 97.5 1820 Kool yarn and cloth mills 44 48 128,992 35.2 1831 Throwsters, spun yarn and cloth mills 67 87 355,684 36.7 1860 Cordupe and twine industry 20 20 14,874 73.1	8 Leading nterprise		
1072 Takeries 1,705 1,768 540,371 33.4 1071 Confectionery manufacturers 118 124 258,955 49.3 1072 Cane and beet sugar processors 7 14 267,472 93.7 1073 Vegetable critis 16 10 160,001 75.5 1073 Vegetable critis 16 10 160,001 75.5 1074 Streellancess for processors meas 23/ 281 905,876 35.2 1075 Streellancess for processors meas 23/ 281 905,876 35.2 1076 Streellancess for processors meas 23/ 281 905,876 35.2 1071 Streellances for processors meas 23/ 281 905,876 35.2 1072 Distilleries 301 363 412,921 46.2 1072 Distilleries 7 42 424,770 96.5 1073 Presertes 7 42 424,770 96.5 1074 Presertes 7 42 424,770 96.5 1074 Presertes 7 42 424,770 96.5 1075 Presertes 7 42 424,770 96.5 1076 Presertes 7 42 424,770 96.5 1077 Presertes 7 42 424,770 96.5 1078 Presertes 7 42 421,424 97.1 1079 Presertes 86 104 722,630 60.6 1079 Presertes 7 10 81,933 78.5 1070 Presertes 7 10 10,933 78.5 1070 Presertes 7 12 197,900 93.8 1070 Presertes 7 12 10,900 93.8 1070 Presertes 7	38.4		
100 Confectionery manufacturers 118 124 258,985 49.3 1157 Cone and beet sugar processors 7 14 267,472 93.7 1693 Vegenable oil cills 10 10 160,001 75.5 1659 Novellancos few processors 100.5 100 10 160,001 75.5 1659 Novellancos few processors 100.5 100 100 100,001 75.5 1659 Novellancos few processors 100.5 100 100 100,001 75.5 1659 Novellancos few processors 100.5 100 100 100,001 100	86.8		
107 Cane and beet sugar processors 7 14 267,472 93.7 1083 Vegerable all sills 16 10 10 160,001 75.5 1083 Miscellarcus for processor, n.e.s. 23/ 281 905,876 35.2 1084 Siscellarcus for processor, n.e.s. 25/ 281 905,876 35.2 1085 Distributes 14 29 443,369 79.7 1085 Distributes 14 29 443,369 79.7 1086 Processor 17 42 484,770 96.5 1084 Processor 17 42 484,770 96.5 1084 Processor 18 20 28 63,608 63.9 1513 Leaf tobacco products sorts 10 11 17 421,424 97.1 1620 Lubber products function 11 17 421,424 97.1 1621 Lubber products function 11 17 421,424 97.1 1622 Lubber products function 15 542 590 594,682 11.3 1720 Leather tanneties 22 30 81,933 78.5 1730 Shoe function 15 15 171 252,354 24.1 1735 Leather place factories 15 151 171 252,354 24.1 1735 Leather place factories 16 151 171 252,354 24.1 1736 Leather place factories 16 151 171 252,354 24.1 1739 Miscellaneous leather products manufacturers 16 16 16 73,669 20.4 1840 Miscellaneous leather products manufacturers 16 16 16 73,669 20.4 1840 Miscellaneous leather products manufacturers 7 12 197,990 93.8 1851 Throwsters, spun yarn and cloth mills 67 87 355,064 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	47.7		
1083 Wegerable oil cills	70.4		
1689 Miscellaricus fe u processors, n.e.s. 237 281 905,876 35.2 1691 Soft diff's reminacturers 361 363 412,921 46.2 1692 Distilleries 14 29 443,369 75.7 1693 Preveries 7 42 484,770 96.5 1694 Wineries 20 28 63,808 63.9 1510 Ivat tobacco processors 6 10 174,812 x 1530 Tobacco process manufacturers 11 17 421,424 97.1 1620 Subber projects manufacturers 86 104 722,630 60.6 1650 Plastics fabricating industry, n.e.s. 542 590 594,682 13.3 1770 Leather tunneries 22 30 81,933 78.5 1740 Shoe function 151 171 252,354 24.1 1750 Leather glove functories 42 46 20,257 40.9 1762 Boot and shoe findings manufacturers 164 164 73,669 20.4 1610 Cotten yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,084 36.7 1840 Cordage and twine industry 20 20 14,874 73.1			
1091 Seft diff's constanturers 301 303 412,921 46.2 1092 Distilleries 14 29 443,369 79.7 1093 Freecries 7 42 484,770 96.5 1094 Wineries 20 28 63,608 63.9 1510 Leaf totaccopyr secret 6 10 174,812 x 1530 Tobaccopyr secret 11 17 421,424 97.1 1620 Fubber products industries 86 104 722,630 60.6 1650 Plastics fabricating industry, n.e.s. 542 590 594,682 13.3 1720 Leather tanneries 22 30 81,933 78.5 1740 Shae factories 151 171 252,354 24.1 1750 Leather glove factories 42 46 20,257 40.9 1762 Boot and shoe findings manufacturers 26 32 18,921 64.2 1799 Miscellumeaus leather products ranufacturers 164 164 73,669 20.4 1810 Cotton yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,084 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	×		
1052 Distilleries 14 29 443,369 79.7 1053 Freecries 7 42 484,770 96.5 1054 Wineries 20 28 63,808 63.9 1510 Teat totaco in essens 6 10 174,812 x 1530 Tobacco predicts transfactores 11 17 421,424 97.1 1620 Fabber profects industries 86 104 722,630 60.6 1650 Flastics fabricating industry, n.e.s. 542 590 594,682 13.3 1720 Leather tunneries 22 30 81,933 78.5 1740 Shoe factories 151 171 252,354 24.1 17750 Leather glace factories 42 46 20,257 40.9 1792 Boot and shoe findings manufacturers 26 32 18,921 64.2 1799 Miscellaneous leather products manufacturers 164 164 73,669 20.4 1810 Cotton yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,064 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	51.2		
1053 Freecries	55.8		
1054 Wineries 20 28 63,808 63.9 1510 Leaf toface presents 6 10 174,812 1520 Tobacco presents transfactorers 11 17 421,424 97.1 1620 Subber presents institutes 86 104 722,630 60.6 1650 Plastics fabricating industry, n.e.s. 542 590 594,682 13.3 1720 Leather tanneties 22 30 81,933 78.5 1720 Shoe factories 151 171 252,354 24.1 1750 Leather glade factories 42 46 20,257 40.9 1762 Eoot and shoe findings manufacturers 26 32 18,921 64.2 1799 Miscellaneous leather products manufacturers 164 164 73,669 20.4 1810 Cotton yath and cloth mills 44 48 128,992 35.2 1821 Fibre and filament yarh manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarh and cloth mills 67 87 355,084 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	95.0		
1510 leaf totaccolit resorts			
1530 Tobacco predicts manufacturers	89.4		
1620 Fabber products industries 86 104 722,630 60.6 1650 Plastics fabricating industry, m.e.s. 542 590 594,682 13.3 1720 Leather tanneries 22 30 81,933 78.5 1740 Shoe factories 151 171 252,354 24.1 1750 Leather glace factories 42 46 20,257 40.9 1792 Boot and shoe findings manufacturers 26 32 18,921 64.2 1779 Miscellaneous leather products ranufacturers 164 164 73,669 20.4 1810 Cotton yarn and eleth wills 9 27 309,607 97.5 1820 Kool yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,064 36.7 1849 Cordage and twine industry 20 20 14,874 73.1	×		
1650 Plastics fabricating industry, n.e.s	99.8		
1720 Leather tunneries 22 30 81,933 78.5 1740 Shoe factories 151 171 252,354 24.1 1750 Leather glove factories 42 46 20,257 40.9 1752 Boot and shoe findings manufacturers 26 32 18,921 64.2 1779 Misaclianeous leather products manufacturers 164 164 73,669 20.4 1810 Cotton yarn and eleth wills 9 27 309,607 97.5 1820 Wool yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,084 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	76.2		
1740 Shoe factories	21.7		
1750 Leather glace factories	92.3		
1792 Boot and shoe findings manufacturers 26 32 18,921 64.2 1799 Miscellaneous leather products manufacturers 164 164 73,669 20.4 1810 Cotton yarn and cloth wills 9 27 309,607 97.5 1820 Wool yarn and cloth mills 44 48 128,992 35.2 1831 Fibre and filament yarn manufacturers 7 12 197,990 93.8 1832 Throwsters, spun yarn and cloth mills 67 87 355,084 36.7 1840 Cordage and twine industry 20 20 14,874 73.1	38.0		
1779 Miscellaneous leather products manufacturers	60.5		
1810 Cotton yarn and eleth wills	82.4		
1810 Wool yarn and cloth mills	34.3		
1831 Fibre and filament yarn manufacturers	×		
1832 Throwsters, spun yarn and cloth mills	54.7		
1840 Corduge and twine industry			
20 14,074 75.1	55.5		
	93.6		
1851 Fibre processing wills	.81.1		
1852 Prepsed and puncted felt ht)1s	91.9		
1860 Carpet, mat and rug industry	65.8		
1871 Cotton and jute bag industry	87.0		

Percentage of Value of Shipments of Goods of Own Manufacture Accounted for by the Leading 4 and Leading 8 Enterprises, by Industry, 1972 Census of Manufactures

			% of Industry Value of Shipments			
;.I.C.	Industry	Enterprises Numb	Establishments er	Shipments \$'000	4 Leading Enterprises	8 Leading Enterprises
1872	Canvas products manufacturers	138	140	36,319	х	49.5
1880	Automobile fabric accessories industry	24	24	202,793	×	96.1
1891	Thread mils	16	17	24,616	x	93.7
1892	Narrow fabric mills	38	41	40,602	52.5	69.2
1893	Embroidery, pleating and hemstitching manufacturers	105	106	15,694	32.1	48.6
.894	Textile dyeing and finishing plants	62	64	85,603	59.6 •	73.6
1899	Miscellaneous textile industries, n.e.s	228	233	204,927	33.3	46.2
2310	Hosiery mills	76	83	90,754	24.1	40.7
:391	Knitted fabric manufacturers	63	69	167,037	33.0	47.4
'392	Other knitting mills	152	159	212,241	18.6	32.2
:431	Men's clothing factories	428	462	621,140	. 11.7	19.5
2432	Men's clothing contractors	150	154	47,353	15.4	26.2
2441	Women's clothing factories	573	598	607,101	8.2	12.3
'442	Women's clothing contractors	280	287	51,608	11.6	18.2
450	Children's clothing industry	138	- 146 -	135,241	13.6	25.4
2460	Fur goods industry	350	350	81,882	29.1	39.0
1480	Foundation garment industry	27	36	57,912	58.5	78.3
2491	Fabric glove manufacturers	12	12	7,049	63.9	93.9
1492	Hat and cap industry	65	6.5	17,285	35.3	49.5
1499	Miscellaneous clothing industries, n.e.s	40	41	18,574	37.5	61.0
2511	Shingle mills	70	72	55,657	42.0	58.4
2513	Sawmills and planing mills	1,463	1,567	1,893,573	18.2	27.7
1520	Vencer and plywood mills	61	84	393,336	48.7	65.8
2541	Sash, door and other millwork plants, n.e.s	650	662	290,516	15.7	23,8
1542	Hardwood flooring plants	14	14	26,949	61.9	84.6
2543	Manufacturers of pre-fabricated buildings (wood frame construction)	65	70	128,077	38.9	54.1
2544	Manufacturers of wooden kitchen cabinets	163	164	63,356	20.0	34.1
2560	Wooden box factories	153	157	62,295	36.6	48.2
2580	Coffin and casket industry	35	43	18,422	46.1	64.0

Percentage of Value of Shipment of Goods of Own Manufacture Accounted for by the Leading 4 and Leading 8 Enterprises, by Industry, 1972 Census of Manufactures

						stry Value Ipments
S.1.C.	Industry	Enterprises Numb	Establishments er	Shipments \$'000	Leading Enterprises	8 Leading Enterprises
2591	Wood preservation industry	19	31	51,108	87.1	95.7
2592	Wood handles and turning industry	36	36	15,669	48.0	70.4
2593	Manufacturers of particle board	10	11	36.606	75.8	x
2599	Miscellaneous wood industries, n.e.s	169	174	49,336	28.3	43.7
2611	Furniture re-upholstery and gepair shops	956	956	35,980	4.4	7.6
2619	Household furniture manufacturers, n.e.s	638	667	492,510	13.3	21.3
2640	Office furniture manufacturers	58	65	107,955	39.3	63.6
2660	Miscellaneous furniture and fixtures manufacturers	387	405	290,508	18.1	26.2
2680	Electric lamp and shade manufacturers	65	65	31,395	29.7	51.4
2710	Pulp and paper mills	65	141	3,127,821	34.4	52.5
2720	Asphalt roofing manufacturers	5	14	62,572	ж	
2731	Folding carton and set-up box manufacturers	98	112	214,355	46.0	59.4
2732	Corrugated box manufacturers	37	74	345,291	54.4	80.7
2733	Paper and plastic bag manufacturers	63	82	210,958	40.5	58.9
2740	Miscellancous paper converters	187	231	453,020	33.5	45.6
2860	Commercial printing	2,072	2,150	859,656	19.5	27.8
2870	Platemaking, typesetting and trade bindery industry .	410	422	109,328	17.9	25.7
2880	Publishing only	479	509	204,334	28.9	43.8
2890	Publishing and printing	565	644	680,214	42.5	66.1
2910	Iron and steel mills	35	48	1,900,799	77.7	90.7
2920	Steel pipe and tube mills	20	28	340,408	73.2	90.1
2940	Iron foundries	100	115	233,487	49.3	65.5
2950	Smelting and refining	14	26	977,961	78.6 .	95.7
2960	Aluminum rolling, casting and extruding	55	68	293,755	89.0	94.9
2970	Copper and copper alloy rolling, casting and extrud-					
	ing	45	49	285,216	81.9	94.6
2980	Metal rolling, casting and $extrudin_{\delta},$ n.e.s	67	79	161,794	41.9	61.3
3010	Boiler and plate works	70	71	245,166	60.9	71.3
3020	Fabricated structural metal industry *	134	156	450,445	37.9	52.6
3031	Metal door and window manufacturers	180	196	186,350	28.1	40.8

Percentage of Value of Shipment of Goods of Own Manufacture Accounted for by the Leading 4 and Leading 8 Enterprises, by Invastry, 1972 Ceases of Manufactures

					2 of Industry Value of Shipments		
5.1.0		Enterprises Numb	Establishments or	\$11; ments \$ '000	4 Leading Enterprises	S Leading Enterprise	
3039	Ornamental and architectural metal industry, n.e.s	459	464	183,311	24.0	37.3	
3041	Metal coating industry	171	178	93,207	29.3	38.5	
3042	Metal stamping and pressing industry	479	528	878,511	39.5	48.3	
3050	Wire and wire products manufacturers	233	265	560,523	43.3	55.1	
3060	Hardware, tool and cutlery manufacturers	560	578	333,631	17.2	26.1	
3070	Heating equipment manufacturers	86	87	113,524	22.1	35.5	
3080	Machine shops	1,000	1,009	219,372	7.3	11.3	
3090	Miscellaneous metal fabricating industries	458	488	557,952	15.0	23.9	
3110	Agricultural implement industry	128	132	317,163	65.2	77.8	
3150	Miscellaneous machinery and equipment manufacturers	710	759	1,454,351	5	21.7	
3160	Commercial refrigeration and air conditioning equipment manufactures.	37	31	101,313	54.0	72 3	
3180	Office and store machinery manufacturers	30	32	261,822	82.7	93.9	
3210	Aircraft and aircraft parts manufacturers	91	96	486,943	x	\$3.4	
3230	Motor vehicle manufacturers	17	22	4,033,647	x	93.1	
3241	Truck body manufacturers	134	137	115,991	33.1	47.0	
3242	Non-commercial trailer manufacturers	97	116	236,139	49.4	75.4	
3243	Commercial trailer manufacturers	31	33	92,395	x	£1.8	
3250	Motor vehicle parts and accessories manufacturers	171	211	1,903,161	48.8	64.3	
3260	Railroad rolling stock industry	11	13	303,585	х		
3270	Ship building and repair	49	54	331,801	63.6	93.9 85.1	
3280	Boat building and repair	238	239	66,159	23.5	37.9	
3290	Miscellaneous vehicle sanufacturers	35	37	177,445	Sú.6	95.8	
3310	Minufacturers of small electrical appliances	49	50	169,768	×		
3320	Manufacturers of major appliances (electric and non-electric)	27	33	396,522	60.1	62.0	
3330	Manufacturers of lighting fixtures	60	66	104,607		0.08	
3340	Manufacturers of household radio and television receivers	19	21		40.7	57.8	
3350	Concunication equipment manufacturers	191	228	310,270	X	94_1	
	Manufacturers of electrical industrial equipment	134		755,763	56.4	67.2	
	Munutacturers of electrical wire and cable	17	176	525,868	51.1	61.4	
		1	35	432,628	79.2	94.6	

Percentage of Value of Shipment of Goods of Own Manufacture Accounted for by the Leading 4 and Leading 8 Enterprises, by Industry, 1972 Census of Manufactures

I of Industry Value of Shipments

S.I.C.	Industry	Enterprises Numbe	Establishments	Shipments	4 Leading Enterprises	8 Leading Enterprises
3391	Battery manufacturers	16	27	60,689	79.3	97.0
3399	Manufacturers of miscellaneous electrical products n.e.	s. 109	117	286,221	54.1	68.5
3511	Clay products manufacturers (from demestic clays)	58	70	55,611	45.0	69.9
3512	Clay products manufcturers (from imported clays)	35	37	39,411	65.9	80.7
3520	Cement manufacturers	8	26	221,353	83.7	100.0
3530	Stone products manufacturers	91	91	15,586	24.9	37.1
3541	Concrete pipe manufacturers	90	98	77,406	45.7	65.8
3542	Manufacturers of structural concrete products	32	36	64,892	43.3	67.0
3549	Concrete products manufacturers, n.e.s	302	331	148,294	36.7	46.3
3550	Ready-mix concrete manufacturers	236	340	358,927	51.1	58.4
3561	Glass ranufacturers	9	18	200,932	97.0	×
3562	Glass products manufacturers	80	85	115,336	73.8	84.0
3570	Abrasives manufacturers	17	23	72,206	86.2	96.6
3580	Line manufacturers	10	12	24,344	72.1	х
3591	Refractories manufacturers	15	17	39,694	74.4	96.7
3599	Miscellaneous non-metallic mineral products industries, n.e.s.	64	84	231,464	58.3	79.1
3651	Petroleum refining	14	41	2,361,709	73.7	94.6
3652	Manufacturers of lubricating oils and greases	14	18	50,672	85.9	96.3
3690	Miscellaneous petroleum and coal products industries	27	43	28,683	50.6	70.6
3720	Manufacturers of mixed fertilizers	23	73	71,171	75.1	89.4
3730	Manufacturers of plastics and synthetic resins	29	41	234,798	57.6	76.8
3740	Manufacturers of pharmaceuticals and medicines	126	141	462,677	27.8	42.3
3750	Paint and varnish manufacturers	128	149	281,321	37.7	54.2
3760	Manufacturers of soap and cleaning compounds	101	117	273,469	72.4	82.2
3770	Manufacturers of toilet preparations	68	69	177,526	45.7	61.9
3781	Manufacturers of pigments and dry colours	16	16	82,818	x	87.7
3782	Manufacturers of industrial chemicals (inorganic), n.e.s.	37	90	401,051	52.4	69. 8
3783	Manufacturers of industrial chemicals (organic), n.e.s.	25	35	483,330	59.9	83.3
3791	Manufacturers of printing inks	24	46	41,290	63.0	82.5

Percentage of Value of Shipment of Goods of Own Minufacture Accounted for by the Lending 4 and Leading 8 Enterprises, by Industry, 1972 Census of Manufactures

					X of Industry Value of Shipments		
S.I.C.	İndustry	Enterprises Numb	Establishments	Shipments \$'000	4 Leading Enterprises	8 Leading Enterprise:	
3799	Miscellaneous chemical industries, n.e.s	280	348	433,667	32.3	43.2	
3911	Instrument and related products tanufacturers	135	138	284,942	52.3	63.9	
3912	Clock and watch manufacturers	18	18	41,254	79.0	94.1	
3913	Orthopaedic and surgical appliances	38	38	7,849	. x	76.3	
3914	Ophthalmic goods manufacturers	49	103	45,532	75.0	85.1	
3915	Dental laboratories	535	548	36,741	21.7	27.3	
3920	Jewellery and silverware industry	287	291	145,565	32.6	43.0	
3931	Sporting goods manufacturers	139	143	123,417	50.1	63.6	
3932	Toys and games manufacturers	65	68	86,629	45.2	€3.2	
3970	Signs and diplays industry	425	431	84,827	12.6	29.2	
3991	Broom, brush and mop manufacturers	71	72	43,147	42.5	02.7	
3992	Button, buckle and fastener manufacturers	31	35	37,967	62.1	77.5	
3993	Floor tile, linoleum and coated fabrics manufacturers	19	21	137,191	52.5	33.2	
3994	Sound recording and musical instrument manufacturers	32	33	40,265	63.5	80.7	
3995	Stamp and stencil (rubber and metal) manufacturers $\boldsymbol{\cdot},$	77	78	15,987	30.1	46.7	
3996	Pen and pencil manufacturers	21	22	23,144	64.8	88.4	
3997	Typewriter supplies manufacturers	11	12	17,146	78.3	95:5	
3998	Fur dressing and dyeing	19	19	9,685	×	83.6	
3999	Other miscellaneous manufacturing industries	334	341	86,522	×	28.8	

DIFFERENCES OF CONCENTRATION RATIOS--

INDIVIDUAL INDUSTRIES

Arrays of simple differences between the top 4 and top 8 concentration ratios compiled according to the four special enterprise sets and those compiled according to the Policy Analysis benchmark enterprise definition:

	r -	Top 4	Ratio	T	op 8 1	Ratio	
		Defin	ition		Defin	ition	
А	В	С	D	А	В	С	D
0.6 0.9 1.5 1.8 3.1 3.7 4.0 5.9	0.6 0.9 1.5 1.8 3.1 3.7 4.0 5.9	0.6 0.6 0.6 1.8 3.1 3.7	-5.7 0.4 0.6 1.8 3.1 3.7 7.1	0.5 0.9 1.7 2.1 2.3 2.4 2.8 2.8	0.5 0.9 1.7 2.1 2.3 2.4 2.8 2.8	0.5 0.9 1.2 1.7 2.3 2.4	-3.6 0.5 0.9 1.0 1.7 2.3 2.4 4.0

Notes

The above differences relate to nine industries, the number of differences never equalling nine because of zero differences. Each column vector refers to a series of industries, sorted into ascending order of the value shown rather than by industry.

The special definitions used are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members:
- D More than 15% ownership plus three interlocking executive board members.

RELATIVE DIFFERENCES OF CONCENTRATION RATIOS --

INDIVIDUAL INDUSTRIES

Arrays of relative differences between the top 4 and top 8 concentration ratios compiled according to the four special enterprise sets and those compiled according to the benchmark definitions:

	Top 4	Ratio		Top 8 Ratio			
	Defini	tion		D	efini	tion	
A	В	С	D	A	В	С	D
	o o				o o		
1.2 1.7 4.0 5.2 8.4 12.0 14.0	1.2 1.7 4.0 5.2 8.4 12.0 14.0	1.2 3.4 4.0 5.2 14.0 18.0	-11.9 1.2 2.2 4.0 5.2 14.0 18.0	0.8 1.3 2.5 3.3 4.7 6.0 6.1	0.8 1.3 2.5 3.3 4.7 6.0 6.1	0.8 1.3 2.5 3.3 4.4 6.1 6.6	-5.5 0.8 1.2 2.5 3.3 3.7 6.1 6.6

Notes

The above differences relate to nine industries, the number of differences never equalling nine because of zero differences. Each column vector refers to a series of industries, sorted into ascending order of the value shown rather than by industry.

The special definitions used are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

SPECIFIED MEANS OF DIFFERENCES BETWEEN THE FOUR SPECIAL SETS OF ENTERPRISE DATA FOR THE MANUFACTURING INDUSTRIES AND DATA COMPILED FOR BENCHMARK COMPARISONS

Top 4 Ratio

Unweighted mean of the simple differences between the top 4 and top 8 concentration ratios for four special enterprise sets and those for the Policy Analysis benchmark concentration data:

Top 8 Ratio

Class		Defi	nition	<u>n</u>		Defini	tion	
	А	В	С	D	А	В	С	D
Less than 30% 30-44% 45-80%	2.6 3.9 1.5	3.9		4.5	2.3 2.4 1.2			2.2
Unweighted me concentration for the bench	ratios to	r the	four	special	es between enterprise	the to	p 4 and and tho	top { se
Less than 30% 30-44% 45-80%	11.2 10.7 2.3	10.7	11.6	11.6	6.9 4.6 1.5		3.7	4.9 3.7 -0.7
Weighted mean concentration the benchmark	ratios to	r the	four	Terences special	between the	e top	4 and t and tho	op 8 se for
Less than 30% 30-44% 45-80%	9.0 7.6 2.4			3.9 7.5 0.4	7.5 3.8 1.6		4.6 3.5 1.7	3.9 3.5 0.5
Number of indu	ustries in	the	cells	of the a	above matri	ces:		
Less than 30% 30-44% 45-80% plus	2 3 3	2 3 3	2 2 2	2 2 3	2 3 3 -	2 3 3	2 3 2	2 3 3
Total	8	8	6	7	8	8	7	8

Notes

Concentration

The definitions referred to are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

Benchmark data are based on use of the greater of the CALURA or Policy Analysis 50% shareholdings code or, if the benchmark so defined is confidential, by the regular McVey code if 1% or less different from the benchmark concentration ratio otherwise applicable.

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TABLE 7
WEIGHTED MEANS AND STANDARD DEVIATIONS OF

CONCENTRATION RATIOS -- MANUFACTURING

Top 4	Weighted Mean	Standard Deviation
Benchmark Measures	50.34974	23.59684
A	50.65856	23.56086
B	50.65856	23.56086
C	50.59796	23.57939
D	50.57469	23.58827
Top 8		
Benchmark measures	63.24774	25.85392
A	63.51049	24.81424
B	63.51049	24.81424
C	63.47005	24.82853
D	63.53071	24.82497

Notes

The definitions referred to are as follows:

Benchmark More than 50% ownership of the voting stock;

- A More than 25% ownership plus three interlocking directors/officers;
- B More than 15% ownership plus three interlocking directors/officers;
- C More than 25% ownership plus three interlocking executive board members;
- D More than 15% ownership plus three interlocking executive board members.

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APPENDIX

ENTERPRISE LISTINGS BY ALTERNATIVE CRITERIA

In the following table, information on the enterprise listings used in this study is set out as follows:

- Column 1 Firm number
- Column 2 Firm name
- Column 3 (0) Country of residence of stock control
- Column 4 (MAPID) CALURA enterprise code
- Column 5 (SIC) 3-digit Standard Industrial Classification code
- Column 6 (50%) More than 50% ownership of the voting stock
- Column 7 (25%+D) More than 25% ownership plus three interlocking directors/officers
- Column 8 (15%+D) More than 15% ownership plus three interlocking directors/officers
- Column 9 (25%+Ex) More than 25% ownership plus three interlocking executive board members
- Column 10 (15%+Ex) More than 15% ownership plus three interlocking executive board members.

FIRM NO. FIRM NAME

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19755 TRADEES SCORNETTES CHURCH ST LTD
2304 TRADEES SCORNETTES CHURCH ST LTD
2305 TRADEES SCORNETTES CHURCH ST LTD
2305 TRADEES SCORNETTES CHURCH ST LTD
2306 TRADEES SCORNETTES CHURCH ST LTD
2307 TRADEES SCORNETTES CORNETTES CHURCH ST LTD
2307 TRADEES SCORNETTES CO
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WELCY HYELD LTD  ASSS ACCEPTANCE CO LTD  ASSS CORPORATES LTD  ASSS CORPORATES CORPORATES  ASSS MATGAGE CREDIT LTD  ASSS FEALTY CREDIT LTD  AND CREDIT LTD  BLANCHARD IND CO INC  E SIDE STAMPING CO LTD  G R PRECISION SYSTEMS  GULF E WESTERN COALTO  GULF	WEW JESSY ZING CG WIND BUNNER CJ LTD CG WIND BUNNER CJ LTD CA LTD CA BARBET ELLIS CT LTD CDN BARDIN SALES LTD CDN AFFENDIN PIGMENTS LTD CA LTD	NATURE OF CONTROL OF THE CONTROL OF CONTROL	AANCO E CO N W TEUST CO N W TEUST CO N W TEUST CO NESTERN PACIFIC FINANCIAL CORP LT	CDN NEXES LTD CDN WESTERN LUMBER CD 1363 LTD CDC WESTERN LUMBER CD 1363 LTD CRCWN ZELLEHBACH RULLDING WATERIALS FASTFRN L CPSWN ZELLERBACH CDA LTD	CROWN ZELLERBACH CROWN (KKF ISLAND LT CROWN ZELLERBACH HARDWICKE ISLAND LT COOWN ZELLERBACH HARDWICK (US) CROWN ZELLERBACH STORTS LTD HUNSCN PAPER CO LTD	INTL WOOD BRIDGETTING LTD SEAFCHTH PLASTICS LTD CEMCO ELECTRICAL MF3 CO LTD CEMCO HOLD LTD	COFFO LTD FASTECH LTD FEOFPAL PACIFIC ELECTRIC CO (	FEDERAL DIONEFR LTD DIONEER ELECTRIC ALTA LTD DIONEER ELECTRIC ARANDON LTI DIONEER ELECTRIC ONT LTD DIONEFR ELECTRIC GASK LTD	STREAMLINE CONNER E GRASS LT U V IND INC (US) REDULIC STEEL CORP (US)	SHERWIN WILLIAMS CO (US) SHERWIN WILLIAMS CO OF COA LTD PALABORA MINING CO LTD(S AFRIC CHRISTIANA SECURITIES CO (US)	ATMOST IND LING SERVICES OF CNT LT BRYDON BRASS ME'S CO LTO FEDFRAL ELECTRIC CORP GREMAR CONNECTORS COA LTO I T T A GREYTIC CORP. I T T A GREYTIC CORP. I T T A GREYTIC CORP.	I T CDA SALES LTD I T ELECTRO PHYSICS LARS I I T GREMAR CONNECTORS COA I T GREMAR INC (US)	I T T IND OF COA LTD
WELCCKN SERVICES LTD ASSS ACCEPTANCE CO LTD ASSS CORPORA AND CORPOR	1106 NEW JESEV AMERICAS CON 1106 NEW JESEV ZINC CO 0228 WIND BUMBER COLLT 1240 ARREST ELLIS JE CA LTD 1620 BARRID COMPANION DI CON 1621 CON BARRID CON LITA	1109 N. LIND INC (US) 0397 NATL LEAD CO (US) 1114 ATLAS ASSURANCE CO LTD 0365 WIRL I FF INSURANCE CO (SWITZEPL 1115 PYL EXCHANGE ASSURANCE CO (SWITZEPL 1117 ZUSTCH INSURANCE CO (SWITZEPL 1175 ASSURANCE CO (SWITZEPL	1118 ANY STRUCT INSCRANCE UP TO USA 1397 N.W. TRUST CO 1119 WESTERN PACIFIC FINANCIAL CORP LT	CDN NEXES LTD CDN WESTERN LUMBER CD 1363 LTD CDC WESTERN LUMBER CD 1363 LTD CRCWN ZELLEHBACH RULLDING WATERIALS FASTFRN L CPSWN ZELLERBACH CDA LTD	1126 CROWN ZELLERBACH CARPY (US) 4564 CROWN ZELLERBACH HARDWICKE ISLAND LT 4564 CROWN ZELLERBACH HILL INC (US) 4665 CROWN ZELLERBACH HILL INC (US) 2005 CROWN ZELLERBACH FIRE CO LTD 3658 HUJSCN, PAPER CO LTD 3658 HUJSCN, PAPER CO LTD	INTL WOOD BRIDGETTING LTD SEAFCHTH PLASTICS LTD CEMCO ELECTRICAL MF3 CO LTD CEMCO HOLD LTD	3354 COFFO LTD 5502 F ASTERN LTD 5036 FEDEPAL PACIFIC ELECTRIC CO (	2125 FEDERAL DIONEFE LTD 2556 FIDNEER FLECTRIC ALTA LTD 2559 DIONEER FLECTRIC PRANDON LTI 2561 DIONEFE FLECTRIC ONT LTD 2562 DIONEFE FLECTRIC GASK LTD	1224 STREAMLINE COMMER & MRASS LT 1222 UV IND INC (US) 1226 REPURLIC STEEL CHRP (US) 3770 RURFESFT CO COM ITD	1236 SHFFWIN WILLIAMS CO (US) 4320 SHFFWIN WILLIAMS CO 90 COA LTD 1237 PALABORA MINING CO LTD(S AFRIC	ATMOST IND LING SERVICES OF CNT LT BRYDON BRASS ME'S CO LTO FEDFRAL ELECTRIC CORP GREMAR CONNECTORS COA LTO I T T A GREYTIC CORP. I T T A GREYTIC CORP. I T T A GREYTIC CORP.	1251 I T CDA SALES LTD 10.2. 1246 I T T ELECTRO PHYSICS LARS I 1264 I T GEMAR CONFECTORS COA 1255 I T GEMAR INC (US)	1253 I T T IND OF COT LTD

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